



UNITED STATES AIR FORCE RESEARCH LABORATORY

Summary of Marine Mammal Occurrence and Population Estimates in U.S. Coastal Waters Subject to Military Aircraft Overflights

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This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER



MARIS M. VIKMANIS
Chief, Crew System Interface Division
Air Force Research Laboratory

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<p>This technical report summarizes marine mammal occurrence data for five separate regions along coastal U.S. where military overflights occur. The five regions are the Northeast Pacific, Southeast Pacific, Gulf of Mexico, Southwest Atlantic, and Northwest Atlantic. The data include marine mammal species summary tables that provide the species common and scientific names, stock identity and most recent estimate of population size, seasonal occurrence index, dive profile, and comments. The information summarized in the tables presents "generalities" with some data based on better information than others.</p>			
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PREFACE

The work reported herein was conducted by Science Applications International Corp. (SAIC), 3990 Old Town Avenue, #105A, San Diego CA 92110 from December 1995 to October 1998 under Air Force contract number F41624-96-C-0005. The work unit number is 30370509. The contract was monitored by Robert A. Lee, Aural Displays and Bioacoustics Branch, Crew System Interface Division, Human Effectiveness Directorate, Air Force Research Laboratory.

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List of Acronyms and Abbreviations

Marine Mammal Stock Identifiers

CA	California Stock
Can-EC	Canadian East Coast Stock
E. FL	Eastern Florida Stock
East N. Pacific	Eastern North Pacific Stock
East. Trop. Pacific	Eastern Tropical Pacific Stock
GM/BF	Gulf of Maine/Bay of Fundy Stock
OR/WA	Oregon/Washington Stock
WN ATL	Western North Atlantic Stock

General

AFB	Air Force Base
Aut-Wtr	Autumn-Winter
CV	Coefficient of Variation
EIS	Environmental Impact Statement
GOM	Gulf of Mexico
NE	Northeast
NW	Northwest
NMFS	National Marine Fisheries Service
OCS	Outer Continental Shelf
SE	Southeast
SEFSC	Southeast Fisheries Science Center
Spr-Sum	Spring-Summer
Sum-Aut	Summer-Autumn
SW	Southwest
SWFSC	Southwest Fisheries Science Center
Wtr-Spr	Winter-Spring
WPAFB	Wright Patterson Air Force Base

OVERVIEW

This technical report summarizes marine mammal occurrence data for Wright Patterson Air Force Base (WPAFB), Aircraft Overflight Regions 1-5, as outlined below:

- (1) **NE PACIFIC: OR/WA** - the area from 42°N-50°N (i.e., Oregon/Washington coast), offshore to ~200 nmi plus a rectangular area measuring ~200 nmi wide by ~600 nmi long extending WNW from Seattle.
- (2) **SE PACIFIC: CA** - the area from ~32°N-40°N (i.e. California coast), offshore to ~200 nmi plus a rectangular area measuring ~200 nmi wide by ~600 nmi long extending SW from Los Angeles.
- (3) **GULF OF MEXICO** - the northern Gulf of Mexico (GOM) from the Florida Keys to the Texas-Mexico border, offshore to ~250 nmi.
- (4) **SW ATLANTIC: FL-SC** - the area from ~33°N-25°N (i.e. roughly from South Carolina to Miami), offshore to ~250 nmi.
- (5) **NW ATLANTIC: NC-ME** - the area from ~33°N-42°N (i.e. roughly from North Carolina to Maine), offshore to ~225 nmi plus a rectangular area measuring ~400 nmi wide by ~600 nmi long extending ENE from Cape Cod.

Regional Maps

Maps for each of the five regions were formatted in ESRI ArcView, such that (if desired) the U.S. Air Force can easily incorporate them into other ecosystem management programs in development (e.g., McGinnis and Pruitt 1997). A map of each region is immediately followed by a marine mammal species summary table. Regions are ordered in a 'counter-clockwise' fashion, starting with the Northeast Pacific Region. Included is an enlarged map of the Southern California Bight, where more detailed information on pinniped occurrence in the Channel Islands is provided. Sanctuaries and reserves are plotted on regional maps as an additional aid for planning appropriate environmental mitigation to overflights. Additional detail on these protected areas is provided in the enclosed Appendix: Sanctuaries and Reserves Summary Tables.

Species Summary Tables

Species summary tables for each region list parameters identified as key to calculations of potential harassment to marine mammals caused by Air Force aircraft overflights. These include: (1) species common to each region, identified by common and scientific names; (2) stock identity and most recent estimate of population size; (3) Wtr-Spr/Sum-Aut seasonal occurrence index; (4) dive profile (i.e., approximate percentage of time at surface); and (5) pertinent comments. Except where noted, stock identity and population estimates can be referenced to the relevant National Marine Fisheries Service (NMFS) Administrative and Stock Assessment Reports (i.e., Barlow [1997], Barlow et al. [1997] and Hill et al. [1997] for Regions 1-2; Waring et al. [1997] for Regions 3-5). Seasonal occurrence and dive profile data can be referenced to the NMFS reports and various scientific reports.

Qualifiers

The information summarized in the species tables represent 'generalities'; some based on better information than others. For example, population estimates presented in the 'SE Pacific: CA table' are more reliable (i.e., more recent and based upon standardized survey protocol) than those for either the NW or SW Atlantic tables. In addition, seasonal occurrence and dive profile information presented in all tables are 'roundhouse guesses' based upon published information. Specific data on these parameters have been collected for a few marine mammal populations, but the quantity and quality of data varies considerably. In the case of 'dive profile', we purposely estimated the 'high end' of surface time in an effort to best represent the time that an animal might be at or near (i.e., within ~10 m) the surface. Furthermore, it is important to remember that marine mammals are not uniformly distributed in any of these regions at any time. Some species are highly seasonal, and their occurrence in fairly high numbers at a particular place and time can be somewhat predicted (e.g., blue whales off Monterey Bay, CA in summer and autumn; right whales in critical habitat nearshore GA and northern FL in winter; northern elephant seals molting at Channel Island rookeries in spring and summer). However, many species are itinerant travelers whose migratory patterns are not well understood, and for whom reliable information on calving, mating and feeding grounds is not available. Therefore, the seasonal occurrence indices and the dive profiles only provide a crude baseline for predictions of marine mammal occurrence.

REGIONAL MAPS AND SPECIES SUMMARY TABLES

Northeast Pacific

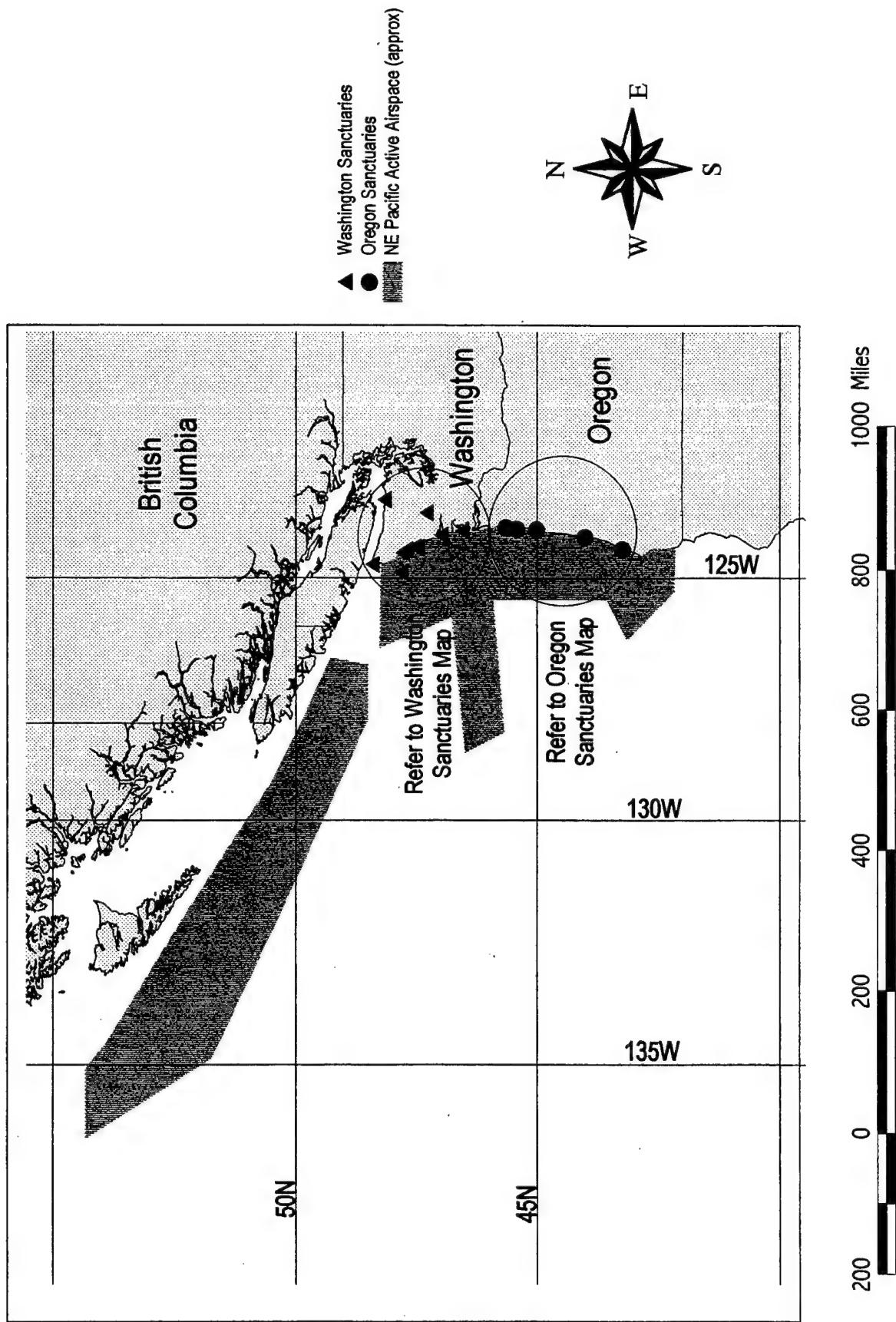


Table 1. Marine mammal population estimates, seasonal occurrences and dive profiles for Northeast Pacific (OR/WA).

Common Name	Scientific Name	Stock	Pop. Est. (CV)	Seasonal Occurrence		Dive Profile	Comment
				Wtr-Spr	Sum-Aut		
MYSTICETES							
Gray whale	<i>Eschrichtius robustus</i>	East. N. Pacific	22,263 (0.09)*	Common	Common	20% at surface	Recent population estimate; some in area year-round with maximum numbers during migration pulses
Blue whale	<i>Balaenoptera musculus</i>	OR/WA	No estimate	Uncommon	Common	20% at surface	SOSUS detections offshore OR/WA July-January (Stafford 1995; Stafford and Fox 1998)
Fin whale	<i>Balaenoptera physalus</i>	OR/WA	136 (0.41)	Uncommon	Common	20% at surface	Year-round call detections via SOSUS (Stafford, pers. comm.)
Minke whale	<i>Balaenoptera acutorostrata</i>	OR/WA	262 (1.00)	Uncommon	Common	20% at surface	Resident whales nearshore WA (Dorsey et al. 1990)
Humpback whale	<i>Megaptera novaeangliae</i>	OR/WA	39 (0.42)	Uncommon	Common	30% at surface	OR: May-Nov.; WA: July-Sep (Brueggeman 1992)
Sei whale	<i>Balaenoptera borealis</i>	East. N. Pacific	No estimate	Uncommon	Uncommon	20% at surface	Pelagic distribution in temperate waters
Northern right whale	<i>Eubalaena glacialis</i>	East. N. Pacific	No Estimate**	Rare	Rare	30% at surface	One seen offshore WA, May 1992 (Carretta et al. 1994)
ODONTOCETES							
Sperm whale	<i>Physeter macrocephalus</i>	OR/WA	303 (0.57)	Common	Common	10% at surface	Offshore OR/WA coast spring & autumn; usually seaward of shelf
Pygmy (or dwarf) sperm whale	<i>Kogia breviceps (or simus)</i>	OR/WA	1,376 (2.0)	Uncommon	Common	20% at surface	Usually seaward of shelf; no separate estimate for <i>K. simus</i>
Killer whale	<i>Orcinus orca</i>	OR/WA	319 (0.80)	Common	Common	30% at surface	Cosmopolitan sp.; resident and transient pods offshore WA/Can. BC
Baird's beaked whale	<i>Berardius bairdii</i>	OR/WA	110 (0.41)	Uncommon	Common	10% at surface	Continental slope and basin habitat
Beaked whales spp.	<i>Mesoplodon spp.</i>	OR/WA	2,438 (0.68)	Unknown	Unknown	10% at surface	spp. = 5 species; continental slope and basin habitat
Risso's dolphin	<i>Grampus griseus</i>	OR/WA	7,065 (0.51)	Uncommon	Common	30% at surface	Continental slope and basin habitat
Northern right whale dolphin	<i>Lissodelphis borealis</i>	OR/WA	4,683 (0.77)	Uncommon	Common	30% at surface	Continental slope and basin habitat
Short-beaked common dolphin	<i>Delphinus delphis</i>	OR/WA	11,194 (1.00)	Uncommon	Common	30% at surface	So. CA = shelf & slope; N. of Pt. Conception = slope and basin
Striped dolphin	<i>Stenella coeruleoalba</i>	OR/WA	113 (2.00)	Uncommon	Common	30% at surface	Offshore waters, usually >100 nm from shore
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	OR/WA	7,180 (1.66)	Uncommon	Common	30% at surface	Continental shelf and slope water
Dall's porpoise	<i>Phocoenoides dalli</i>	OR/WA	63,152 (0.78)	Uncommon	Common	30% at surface	So. CA = shelf & slope; N. of Pt. Conception = slope and basin
Harbor porpoise	<i>Phocoena phocoena</i>	OR/WA Coastal	26,175 (0.21)***	Common	Common	30% at surface	97% in water < 200m deep; no seasonal movements documented
		Inland WA	3,352 (0.27)***	Common	Common	30% at surface	Puget Sound; Juan de Fuca & Georgia straits
PINNIPEDS							
California sea lion	<i>Zalophus c. californianus</i>	U.S.	167,000-188,000 (n/a)***	Uncommon	Common	30% at surface	Breed on Channel Is. May-June; Molt females Aug-Oct, males Nov-Feb
Harbor seal	<i>Phoca vitulina richardsi</i>	OR/WA Coastal	27,131 (0.07)***	Common	Common	30% at surface	Breed So. CA islands & central CA shore March-May; Molt May-August
		Inland WA	16,253 (0.07)***	Common	Common	30% at surface	
Northern elephant seal	<i>Mirounga angustirostris</i>	CA Breeding	84,000 (n/a)***	Uncommon	Common	10% at surface	Breed on Channel Is. Dec-March; Molt females Apr-May, males Jun-Aug
Northern fur seal	<i>Callorhinus ursinus</i>	San Miguel Is.	10,036 (n/a)***	Uncommon	Common	30% at surface	Breed San Miguel Is. June-Aug; Molt undetermined
Steller sea lion	<i>Eumetopias jubatus</i>	E. AK/OR/ WA/CA	37,746 (n/a)*	Uncommon	Common	30% at surface	Breed coastal OR June-July; Molt Aug-Sep
MUSTELIDS							
Sea otter	<i>Enhydra lutris lutris</i>	WA	200-300**	Common	Common	50% at surface	Small breeding colony offshore NE WA coast

NOTES

Population Estimates:

Barlow 1997: Table 5

* Hobbs et al. in press

** Carretta et al. 1994

*** Barlow 1997

^ Hill et al. 1997

^^ Benz 1996

(n/a) = not available

Seasonal Index:

Barlow 1995

Forney et al. 1995

Brueggeman (ed.) 1992

Dive Profile:

Leatherwood et al. 1983

Ridgway and Harrison 1985, 1989

Reeves et al. 1992

note: pinniped dive profile for 'at sea' interval only

Southeast Pacific

- Southern California Sanctuaries
- ▲ Mid-California Sanctuaries
- SE Pacific Active Airspace (approx)

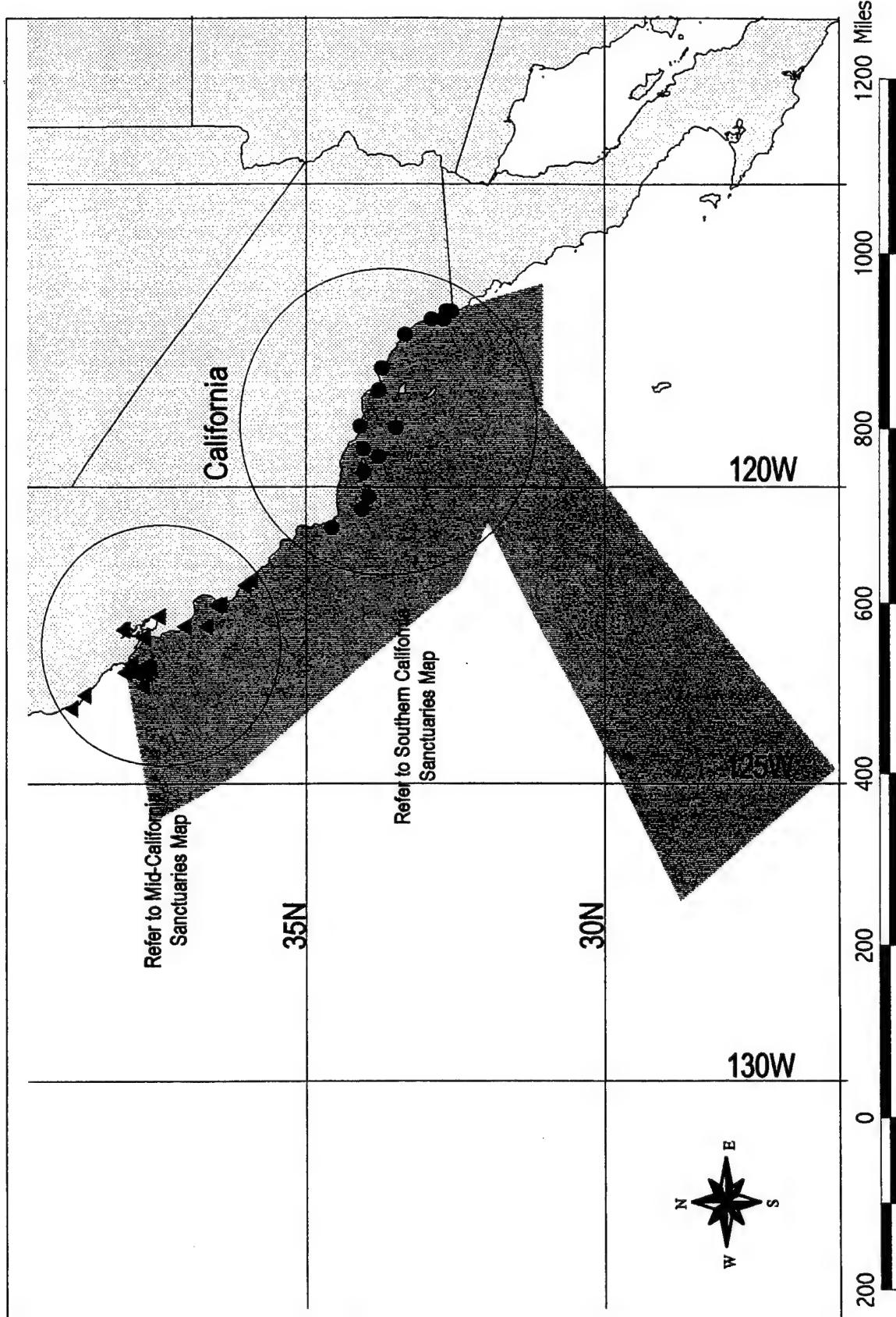


Table 2. Marine mammal population estimates, seasonal occurrences and dive profiles for Southeast Pacific (CA).

Common Name	Scientific Name	Stock	Pop. Est. (CV)	Seasonal Index		Dive Profile	Comment
				Wtr-Spr	Sum-Aut		
MYSTICETES							
Gray whale	<i>Eschrichtius robustus</i>	East. N. Pacific	22,263 (0.09)*	Common	Uncommon	20% at surface	Good/recent population estimate
Blue whale	<i>Balaenoptera musculus</i>	CA (1996)	2,146 (0.23)	Uncommon	Common	20% at surface	Good/recent population estimate
Fin whale	<i>Balaenoptera physalus</i>	CA (1996)	1,896 (0.59)	Uncommon	Common	20% at surface	Good/recent population estimate
Minke whale	<i>Balaenoptera acutorostrata</i>	CA (1996)	446 (0.44)	Uncommon	Common	20% at surface	Resident whales in shelf waters
Humpback whale	<i>Megaptera novaeangliae</i>	CA (1996)	1,701 (0.33)	Uncommon	Common	30% at surface	Common offshore Santa Barbara
Bryde's whale	<i>Balaenoptera edeni</i>	CA (1991/93)	24 (2.0)	Uncommon	Uncommon	20% at surface	Possible northern extent of ETP stock
Sei (or Bryde's) whale	<i>Balaenoptera borealis</i> (or <i>edeni</i>)	CA (1991/93)	36 (0.71)	Uncommon	Uncommon	20% at surface	Pelagic distribution in temperate waters
Northern right whale	<i>Eubalaena glacialis</i>	CA (1991/92)	16 (1.11)**	Rare	Rare	30% at surface	Coastal distribution; scattered sightings in recent years in coastal CA waters
ODONTOCETES							
Sperm whale	<i>Physeter macrocephalus</i>	CA (1991/93)	1,231 (0.39)	Common	Common	10% at surface	Year-round offshore CA; usually seaward of shelf
Pygmy sperm whale	<i>Kogia breviceps</i>	CA (1991/93)	3,145 (0.54)	Uncommon	Uncommon	20% at surface	Usually seaward of shelf; no separate estimate for <i>K. simus</i>
Killer whale	<i>Orcinus orca</i>	CA (1991/93)	747 (0.71)	Uncommon	Uncommon	30% at surface	Cosmopolitan sp.; infrequent sightings offshore CA
Baird's beaked whale	<i>Berardius bairdii</i>	CA (1991/93)	380 (0.53)	Uncommon	Common	10% at surface	Continental slope and basin habitat
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	CA (1991/93)	9,163 (0.52)	Unknown	Unknown	10% at surface	Continental slope and basin habitat
Beaked whales spp.	<i>Mesoplodon</i> spp.	CA (1991/93)	1,378 (0.58)	Unknown	Unknown	10% at surface	Continental slope and basin habitat
Risso's dolphin	<i>Grampus griseus</i>	CA (1991/93)	10,720 (0.41)	Common	Uncommon	30% at surface	So. CA = shelf & slope; N. of Pt. Conception = slope and basin
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	CA (1991/93)	1,004 (0.37)	Common	Uncommon	30% at surface	So. CA population reduced post 1982 El Nino
Northern right whale dolphin	<i>Lissodelphis borealis</i>	CA (1996)	9,131 (0.77)	Common	Uncommon	30% at surface	So. CA = shelf & slope; N. of Pt. Conception = slope and basin
Long-beaked common dolphin	<i>Delphinus capensis</i>	CA (1996)	72,251 (0.83)	Uncommon	Common	30% at surface	So. CA shelf, usually <50 nm from shore
Short-beaked common dolphin	<i>Delphinus delphis</i>	CA (1991/93)	372,425 (0.22)	Uncommon	Common	30% at surface	So. CA = shelf & slope; N. of Pt. Conception = slope and basin
Striped dolphin	<i>Stenella coeruleoalba</i>	CA (1991/93)	24,910 (0.31)	Uncommon	Common	30% at surface	Offshore waters, usually >100 nm from shore
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	CA (1996)	60,026 (0.84)	Common	Uncommon	30% at surface	Continental shelf and slope water
Bottlenose dolphin	<i>Tursiops truncatus</i>	CA (1991/93)	1,850 (0.50)	Common	Common	30% at surface	Continental shelf, usually S. of Pt. Conception and often < ~1 nm from shore
Dall's porpoise	<i>Phocoenoides dalli</i>	CA (1996)	60,756 (0.50)	Common	Uncommon	30% at surface	So. CA = shelf & slope; N. of Pt. Conception = slope and basin
Harbor porpoise	<i>Phocoena phocoena</i>	Central CA	4,120 (0.22)***	Common	Common	30% at surface	Pt. Conception & north, usually < 10 nm from shore
PINNIPEDS							
California sea lion	<i>Zalophus c. californianus</i>	U.S.	167,000-188,000 (n/a)***	Common	Common	30% at surface	Breed on Channel Is. May-June; Molt females Aug-Oct, males Nov-Feb
Harbor seal	<i>Phoca vitulina richardsi</i>	CA	30,293 (n/a)***	Common	Common	30% at surface	Breed So. CA islands & central shore March-May; Molt May-August
Northern elephant seal	<i>Mirounga angustirostris</i>	CA Breeding	84,000 (n/a)***	Common	Uncommon	10% at surface	Breed on Channel Is. Dec-March; Molt females Apr-May, males Jun-Aug
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	CA/Mexico	7,408 (n/a)***	Uncommon	Common	30% at surface	Haul out on Channel Is.; breed June-July in Mex; Molt undetermined
Northern fur seal	<i>Callorhinus ursinus</i>	San Miguel Is.	10,036 (n/a)***	Uncommon	Common	30% at surface	Breed San Miguel Is. June-August; Molt undetermined
MUSTELIDS							
Sea otter	<i>Enhydra lutris nereis</i>	Experimental pop.	<~20^	Uncommon	Uncommon	50% at surface	Small population, with some breeding, near San Nicolas Is.

NOTES

Population Estimates:

Barlow 1997: Table 5

* Hobbs et al. in press

** Forney et al. 1995

*** Barlow et al. 1997

^A Benz 1996

(n/a) = not available

Seasonal Index:

Barlow 1995

Forney et al. 1995

Dive Profile:

Leatherwood et al. 1983

Ridgway and Harrison 1985, 1989

Reeves et al. 1992

note: pinniped dive profile for 'at sea' interval only

Pinnipeds of the Southern California Bight



Pinniped occurrence in the Southern California Bight. * indicates juvenile.

Species		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Harbor seal	Primary behavior	feed	feed	pup/mate	pup/mate	molt	molt	molt	molt	feed	feed	feed	feed
	Sex/Age Class	♂ ♀	♂ ♀	♂ ♀	♂ ♀	♂ ♀	♂ ♀	♂ ♀	♂ ♀	♂ ♀	♂ ♀	♂ ♀	♂ ♀
N. elephant seal	Primary behavior	pup/mate	pup/mate		molt	molt	molt	molt	molt				pup/mate
	Sex/Age Class	♂ ♀	♂ ♀		♀ *	♀ *	♂	♂	♂				♂ ♀
CA sea lion	Primary behavior	molt	molt			pup/mate	pup/mate	pup/mate	feed	molt	molt	molt	molt
	Sex/Age Class	♂	♂			♂ ♀	♂ ♀	♂ ♀	♀ *	♀ *	♀	♂	♂
N. fur seal	Primary behavior	feed	feed	feed		pup/mate							
	Sex/Age Class	♀ *	♀ *	♀ *		♂	♂ ♀	♀	♀	♀	♀	♀	

Gulf of Mexico

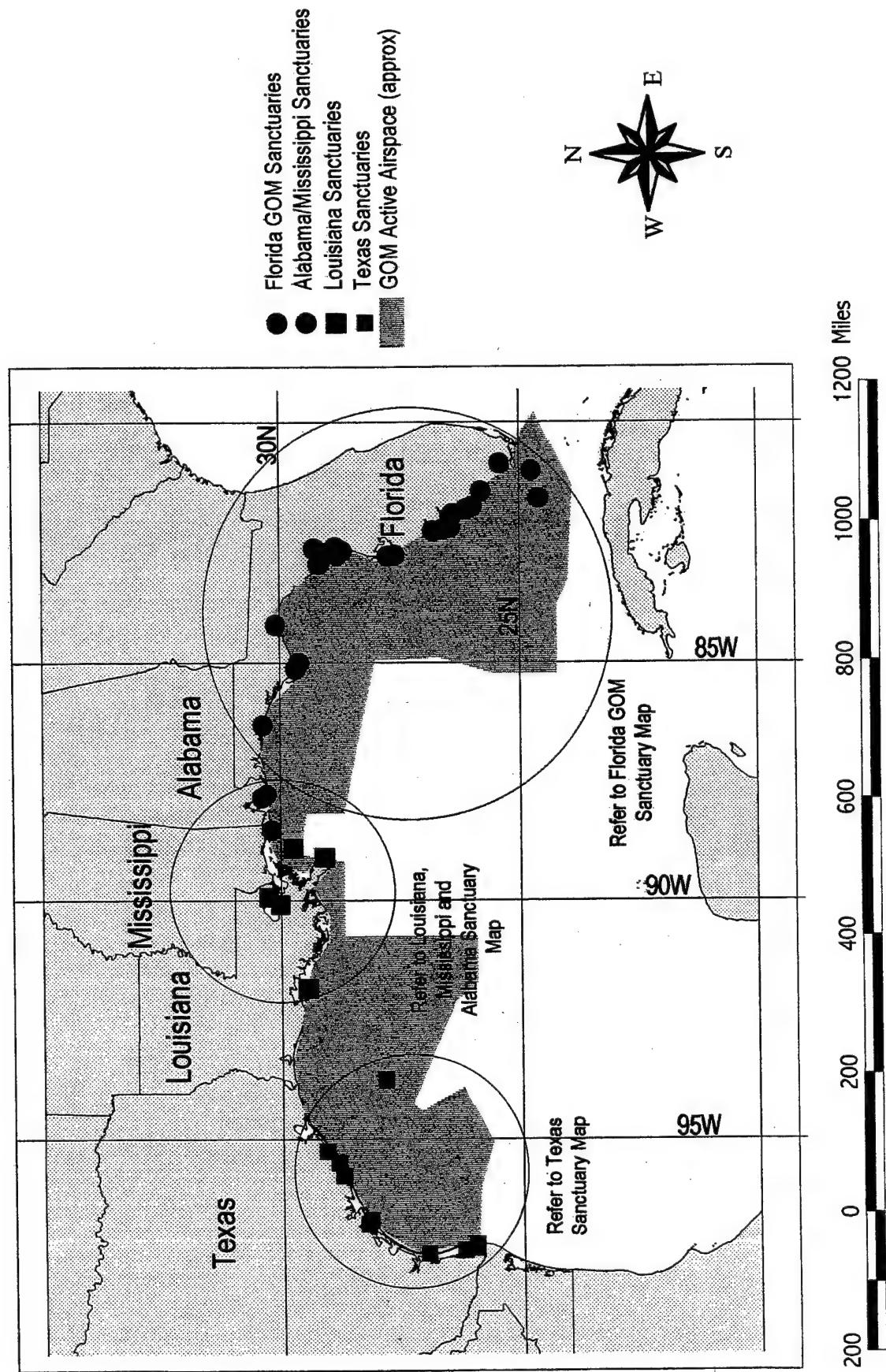


Table 3. Marine mammal population estimates, seasonal occurrences and dive profiles for Gulf of Mexico (TX to FL).

Common Name	Scientific Name	Stock	Pop. Est. (CV)	Seasonal Index		Dive Profile	Comment
				Spr-Sum	Aut-Win		
MYSTICETES							
Fin whale	<i>Balaenoptera physalus</i>	N GOM	No estimate*	Rare	Rare	20% at surface	Few sightings on shelf between FL panhandle and LA
Minke whale	<i>Balaenoptera acutorostrata</i>	N GOM	No estimate*	Rare	Rare	20% at surface	Coastal sightings, especially FL Keys
Humpback whale	<i>Megaptera novaeangliae</i>	N GOM	No estimate*	Rare	Rare	20% at surface	West FL coast to LA
Bryde's whale	<i>Balaenoptera edeni</i>	N GOM	35 (1.10)	Common	Common	20% at surface	Shelf edge DeSoto Canyon and offshore FL panhandle
ODONTOCETES							
Sperm whale	<i>Physeter macrocephalus</i>	N GOM	530 (0.31)	Common	Common	10% at surface	Most common large whale in GOM, usually in slope/basin habitat
Dwarf/Pygmy Sperm whale	<i>Kogia spp.</i>	N GOM	547 (0.28)	Common	Common	20% at surface	Continental slope and basin habitat
Killer whale	<i>Orcinus orca</i>	N GOM	277 (0.42)	Common	Uncommon	30% at surface	Continental slope and basin habitat
Pygmy Killer whale	<i>Feresa attenuata</i>	N GOM	518 (0.81)	Uncommon	Uncommon	30% at surface	Continental slope and basin habitat
False Killer whale	<i>Pseudorca crassidens</i>	N GOM	381 (0.62)	Common	Common	30% at surface	Continental slope and basin habitat
Cuvier's Beaked whale	<i>Ziphius cavirostris</i>	N GOM	30 (0.50)	Common	Common	10% at surface	Continental slope and basin habitat
Beaked whales spp.	<i>Mesoplodon spp.</i>	N GOM	117 (0.38)	Unknown	Unknown	10% at surface	Continental slope and basin habitat
Risso's dolphin	<i>Grampus griseus</i>	N GOM	2,749 (0.27)	Common	Uncommon	30% at surface	Continental shelf and slope habitat
Short-finned Pilot whale	<i>Globicephala macrorhynchus</i>	N GOM	353 (0.89)	Uncommon	Uncommon	30% at surface	Continental shelf and slope habitat
Melon-headed whale	<i>Peponocephala electra</i>	N GOM	3,965 (0.39)	Common	Common	30% at surface	Continental slope and basin habitat
Fraser's dolphin	<i>Lagenodelphis hosei</i>	N GOM	127 (0.90)	Common	Common	30% at surface	Continental slope and basin habitat
Atlantic Spotted dolphin	<i>Stenella frontalis</i>	N GOM	3,213 (0.44)	Common	Uncommon	30% at surface	Continental shelf and shelf-edge habitat
Pantropical Spotted dolphin	<i>Stenella attenuata</i>	N GOM	31,320 (0.20)	Common	Common	30% at surface	Continental slope and basin habitat
Striped dolphin	<i>Stenella coeruleoalba</i>	N GOM	4,858 (0.44)	Common	Common	30% at surface	Continental slope and basin habitat
Spinner dolphin	<i>Stenella longirostris</i>	N GOM	6,316 (0.43)	Uncommon	Uncommon	30% at surface	Continental slope and basin habitat
Clymene dolphin	<i>Stenella clymene</i>	N GOM	5,571 (0.37)	Common	Common	30% at surface	Continental slope and basin habitat
Rough-toothed dolphin	<i>Steno bredanensis</i>	N GOM	852 (0.31)	Uncommon	Uncommon	30% at surface	Continental slope and basin habitat
Bottlenose dolphin	<i>Tursiops truncatus</i>	GOM (OCS) GOM (SES) W GOM (CS) N GOM (CS) E GOM (CS) GOM (S&E)	50,247 (0.18) 5,618 (0.26) 3,499 (0.21) 4,191 (0.21) 9,912 (0.12) combined est. = 5,141 (n/a)	Common Common Common Common Common Common	Common Common Common Common Common Common	30% at surface 30% at surface 30% at surface 30% at surface 30% at surface 30% at surface	Outer Continental Shelf stock; habitat ~18m-183m isobaths Shelf Edge & Slope stock; habitat >183m isobath Coastal Stock; habitat <18m isobath Coastal Stock; habitat <18m isobath Coastal Stock; habitat <18m isobath Sound and Estuarine Stocks; discrete geo-based communities
SIRENIAN							
Florida manatee	<i>Trichechus manatus</i>	W. FL	count = 949** (n/a)	Common	Common	90% at surface	Best count; associated w/ warm coastal and riverine waters

NOTES

Population Estimates:

Waring et al. 1997

*Jefferson and Schiro 1997

**USFWS 1995

(n/a) = not available

Seasonal Index:

Jefferson and Schiro 1997

Jefferson 1996

Dive Profile:

Leatherwood et al. 1983

Ridgway and Harrison 1985, 1989

Reeves et al. 1992

Southwest Atlantic

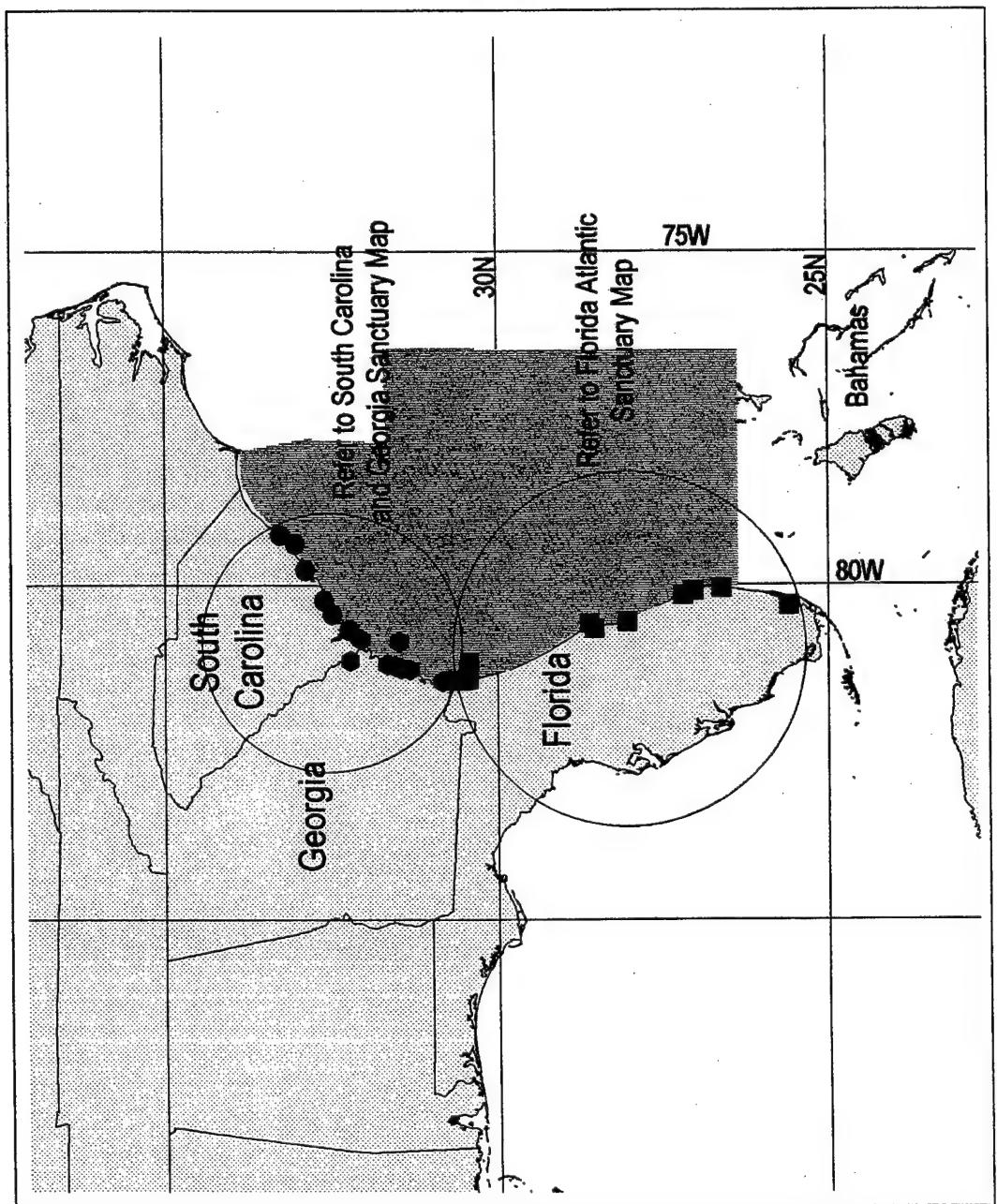


Table 4. Marine mammal population estimates, seasonal occurrences and dive profiles for Southwest Atlantic (FL to SC).

Common Name	Scientific Name	Stock	Pop. Est. (CV)	Seasonal Index		Dive Profile	Comment
				Wtr-Spr	Sum-Aut		
MYSTICETES							
Blue whale	<i>Balaenoptera musculus</i>	WN ATL	No estimate	Rare	Rare	20% at surface	No population estimate for waters south of Cape Hatteras; calls tracked via SOSUS (Gagnon and Clark 1993)
Fin whale	<i>Balaenoptera physalus</i>	WN ATL	2,700 (0.59)	Common	Uncommon	20% at surface	Partial-range (1991-92) population estimate, calve mid-Atlantic Oct-Jan
Sei whale	<i>Balaenoptera borealis</i>	WN ATL	253 (0.63)	Common	Uncommon	20% at surface	Poor/old population estimate for spring season (CeTAP 1978-82)
Minke whale	<i>Balaenoptera acutorostrata</i>	CAN EC	2,650 (0.31)	Common	Uncommon	20% at surface	Partial-range (1991-92) population estimate for one (CAN EC) of four stocks identified in the North Atlantic
Humpback whale	<i>Megaptera novaeangliae</i>	WN ATL	5,543 (0.16)	Common	Uncommon	30% at surface	Partial range-estimate; winter in Caribbean north of Dominican Republic to waters near Bermuda
Northern right whale	<i>Eubalaena glacialis</i>	WN ATL	Census = 295 (n/a)	Common	Uncommon	40% at surface	Census (295 photo-ID individuals) is minimum estimate ; critical breeding habitat offshore northern FL & south GA
ODONTOCETES							
Sperm whale	<i>Physeter macrocephalus</i>	WN ATL	2,698 (0.67)	Common	Uncommon	10% at surface	1995 population estimate; females and juveniles in subtropics FL to Caribbean (Watkins and Moore 1982)
Dwarf/Pygmy sperm whale	<i>Kogia spp.</i>	WN ATL	420 (0.60)	Unknown	Unknown	20% at surface	1992 population estimate for Miami-to-Cape Hatteras from line-transect vessel survey
Killer whale	<i>Orcinus orca</i>	WN ATL	No estimate	Uncommon	Uncommon	30% at surface	Largest single sighting = 40 whales in southern Gulf of Maine, September 1979
Pygmy killer whale	<i>Feresa attenuata</i>	WN ATL	No estimate	Unknown	Unknown	30% at surface	Largest single sighting = 6 whales during 1992 Miami-to-Cape Hatteras line-transect vessel survey
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	WN ATL	No estimate	Unknown	Unknown	10% at surface	Cosmopolitan distribution, generally seaward of continental slope
Beaked whales spp.	<i>Mesoplodon spp.</i>	WN ATL	1,519 (0.69)	Unknown	Unknown	10% at surface	1995 population estimate for VA-Gulf of St. Lawrence survey; strandings to FL coast
Risso's dolphin	<i>Grampus griseus</i>	WN ATL	16,818 (0.52)	Common	Uncommon	30% at surface	Associated w/ Gulf Stream north wall & warm core rings
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	WN ATL	749 (0.64)	Common	Uncommon	30% at surface	Associated w/ tropical-warm temperate waters
Common dolphin	<i>Delphinus delphis</i>	WN ATL	22,215 (0.45)	Common	Uncommon	30% at surface	Associated w/ tropical-temperate waters
Atlantic/Pantropical spotted dolphin	<i>Stenella spp.</i>	WN ATL	4,772 (1.27)	Common	Common	30% at surface	Associated w/ tropical-warm temperate waters
Striped dolphin	<i>Stenella coeruleoalba</i>	WN ATL	31,669 (0.73)	Common	Common	30% at surface	Associated w/ tropical-temperate waters; revised CeTAP estimate (1982)
Spinner dolphin	<i>Stenella longirostris</i>	WN ATL	No estimate	Uncommon	Uncommon	30% at surface	Few sightings (presumably) due to offshore distribution
Bottlenose dolphin	<i>Tursiops truncatus</i>	WN ATL (OS)	13,453 (0.54)	Common	Common	30% at surface	Offshore Stock - associated w/ continental shelf break; strandings south to FL
		WN ATL (CS)	High count = 815 (n/a)	Common	Common	30% at surface	Coastal Stock - associated w/ continental shelf, count from NC-FL
PINNIPEDS							
Harbor seal	<i>Phoca vitulina</i>	WN ATL	Count = 28,810 (n/a)	Uncommon	Uncommon	30% at surface	Maine coast count; associated w/ temperate & subpolar waters; sightings and strandings south to GA
Hooded seal	<i>Crystophora cristata</i>	WN ATL	400,000-450,000	Uncommon	Uncommon	30% at surface	Range as far south as Puerto Rico and FL
SIRENIAN							
Florida manatee	<i>Trichechus manatus</i>	E. FL	Count = 907** (n/a)	Common	Common	90% at surface	Best count; associated w/ warm coastal and riverine waters

NOTES

Population Estimates:

Waring et al. 1997

** USFSW 1995

Seasonal Index:

Waring et al. 1997

Leatherwood et al 1983

Dive Profile:

Leatherwood et al. 1983

Ridgway and Harrison 1985, 1989

Reeves et al. 1992

note: pinniped dive profile for at sea' interval only

Northwest Atlantic

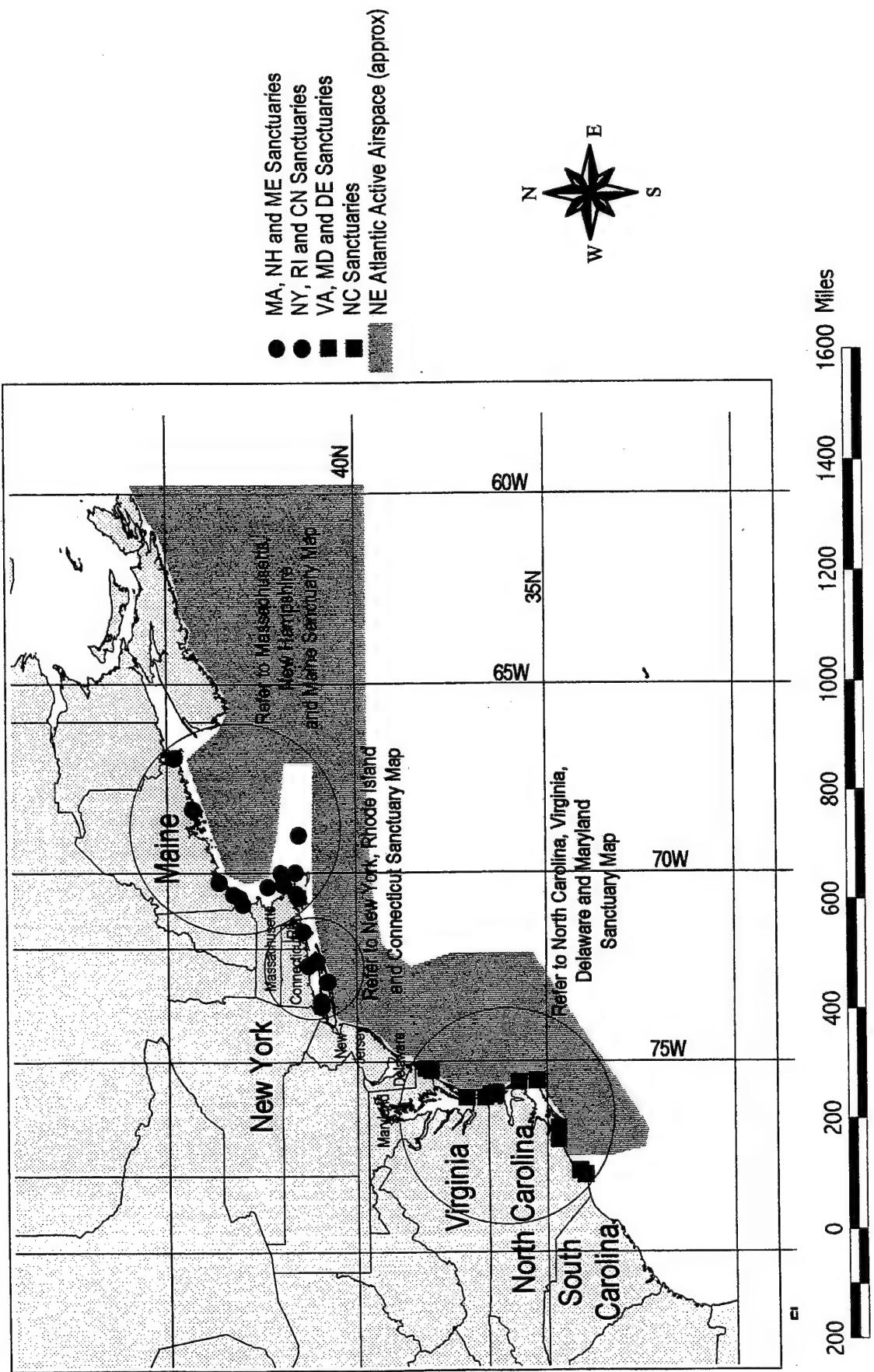


Table 5. Marine mammal population estimates, seasonal occurrences and dive profiles for Northwest Atlantic (NC to ME).

Common Name	Scientific Name	Stock	Pop. Est. (CV)	Seasonal Index		Dive Profile	Comment
				Wtr-Spr	Sum-Aut		
MYSTICETES							
Blue whale	<i>Balaenoptera musculus</i>	WN ATL	Count = 308 (n/a)	Uncommon	Uncommon	20% at surface	Catalog of 308 photo ID individuals from Gulf of St. Lawrence area
Fin whale	<i>Balaenoptera physalus</i>	WN ATL	2,700 (0.59)	Common	Common	20% at surface	Partial-range (1991-92) population estimate; calve mid-Atlantic Oct-Jan
Sei whale	<i>Balaenoptera borealis</i>	WN ATL	253 (0.63)	Uncommon	Common	20% at surface	Poor/old population estimate for spring season (CeTAP 1978-82)
Minke whale	<i>Balaenoptera acutorostrata</i>	CAN EC	2,650 (0.31)	Uncommon	Common	20% at surface	Partial-range (1991-92) population estimate for one (CAN EC) of four stocks identified in the North Atlantic
Humpback whale	<i>Megaptera novaeangliae</i>	WN ATL	5,543 (0.16)	Uncommon	Common	30% at surface	Partial-range estimate; five feeding-aggregations in WN ATL
Northern right whale	<i>Eubalaena glacialis</i>	WN ATL	Census = 295 (n/a)	Uncommon	Common	40% at surface	Census (295 photo ID individuals) is a minimum estimate; critical feeding habitat offshore MA
ODONTOCETES							
Sperm whale	<i>Physeter macrocephalus</i>	WN ATL	2,698 (0.67)	Uncommon	Common	10% at surface	1995 pop. estimate, whales generally seaward of shelf and often associated with edge and warm core eddies of the Gulf Stream (Waring et al. 1993; Griffin 1998)
Dwarf/Pygmy sperm whale	<i>Kogia spp.</i>	WN ATL	420 (0.60)	Unknown	Unknown	20% at surface	1992 population estimate for Miami-to-Cape Hatteras from line-transect vessel survey
Killer whale	<i>Orcinus orca</i>	WN ATL	No estimate	Uncommon	Uncommon	30% at surface	Largest single sighting = 40 whales in southern Gulf of Maine, September 1979
Pygmy killer whale	<i>Feresa attenuata</i>	WN ATL	No estimate	Unknown	Unknown	30% at surface	Largest single sighting = 6 whales during 1992 Miami-to-Cape Hatteras line-transect vessel survey
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>	WN ATL	No estimate	Rare	Rare	10% at surface	Pop est = 230 (95% CI= 160-360) for 'the Gulf', a discrete depth feature N. of Sable Is. Nova Scotia CAN (Whitehead et al. 1997)
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	WN ATL	No estimate	Rare	Rare	10% at surface	Considered rare off NE U.S. coast; most sightings in late spring or summer usually along continental shelf edge
Beaked whales spp.	<i>Mesoplodon spp.</i>	WN ATL	1,519 (0.69)	Unknown	Unknown	10% at surface	1995 population estimate for VA-Gulf of St. Lawrence survey
Risso's dolphin	<i>Grampus griseus</i>	WN ATL	16,818 (0.52)	Common	Common	30% at surface	Associated w/ Gulf Stream north wall & warm core rings
Long/Short-finned pilot whale	<i>Globicephala spp.</i>	WN ATL	8,176 (0.65)	Common	Common	30% at surface	Associated w/ Gulf Stream north wall & thermal fronts
White-sided dolphin	<i>Lagenorhynchus acutus</i>	WN ATL	27,200 (0.43)	Uncommon	Common	30% at surface	Associated w/ temperate and sub-polar waters; continental shelf, to ~100m depth contour
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	WN ATL	573 (0.69)	Common	Common	30% at surface	Poor/old population estimate for spring season (CeTAP 1978-82); associated w/ temperate and sub-polar waters
Common dolphin	<i>Delphinus delphis</i>	WN ATL	22,215 (0.45)	Uncommon	Common	30% at surface	Associated w/ tropical-temperate waters
Atlantic (& pantropical) spotted dolphin	<i>Stenella spp.</i>	WN ATL	4,772 (1.27)	Uncommon	Common	30% at surface	Associated w/ tropical-warm temperate waters
Striped dolphin	<i>Stenella coeruleoalba</i>	WN ATL	31,669 (0.73)	Uncommon	Common	30% at surface	Associated w/ tropical-temperate waters
Spinner dolphin	<i>Stenella longirostris</i>	WN ATL	No estimate	Rare	Rare	30% at surface	Few sightings (presumably) due to offshore distribution
Bottlenose dolphin	<i>Tursiops truncatus</i>	WN ATL (OS)	13,453 (0.54)	Common	Common	30% at surface	Offshore Stock - associated w/ continental shelf break; July-Sep. '95 estimate VA-Gulf St. Lawrence
		WN ATL (CS)	High count = 1,667 (n/a)	Common	Common	30% at surface	Coastal Stock - associated w/ continental shelf; count from NC to NJ
Harbor porpoise	<i>Phocoena phocoena</i>	GM/BF	54,300 (0.14)	Uncommon	Common	30% at surface	Gulf of Maine/Bay of Fundy stock; average of 1991, 1992 and 1995 population estimates; concentrate nearshore GM in summer
PINNIPEDS							
Harbor seal	<i>Phoca vitulina</i>	WN ATL	Count = 28,810 (n/a)	Common	Common	30% at surface	Summer 1993 Maine coast count; assoc. w/ temperate & subpolar waters; pup/breed in May-June
Gray seal	<i>Halichoerus grypus</i>	Sable Is. to Gulf St. Law	Count = 143,000 (n/a)	Common	Uncommon	30% at surface	1993-1994 population estimates; pup/breed from late Sep. to early March; molt May-June
		Maine coast offshore MA	500-1000 Count = 2,035 (n/a)	Common	Uncommon		
Harp seal	<i>Phoca groenlandica</i>	N. Atlantic	3 million	Common	Uncommon	30% at surface	Population estimate for 1990; pup/breed from mid-Feb to April; molt April
Hooded seal	<i>Cystophora cristata</i>	WN ATL	400,000-450,000	Common	Uncommon	30% at surface	Population estimate from 'pup production' model (Stenson 1993); highly migratory; pup/breed in February

NOTES

Population Estimates:

Waring et al. 1997
(n/a) = not available

Seasonal Index:

Waring et al. 1997
Leatherwood et al. 1983

Dive Profile:

Leatherwood et al. 1983
Ridgway and Harrison 1985, 1989
Reeves et al. 1992
note: pinniped dive profile for 'at sea' interval only

REFERENCES

- Barlow, J. 1997. Preliminary estimates of cetacean abundance off California, Oregon and Washington based on a 1996 ship survey and comparisons of passing and closing modes. NOAA/NMFS/SWFSC Administrative Report LJ-97-11.
- Barlow, J. 1995. The abundance of cetaceans in California waters. Part I: Ship surveys in summer and fall of 1991. *Fishery Bulletin* 93: 1-14.
- Barlow, J., K.A. Forney, P.S. Hill, R.L. Brownell, Jr., J.V. Carretta, D.P. DeMaster, F. Julian, M.S. Lowry, T. Ragen and R.R. Reeves. 1997. U.S. Pacific Marine Mammal Stock Assessments. NOAA-TM-NMFS-SWFSC-248, 223 pp.
- Benz, C. 1996. Evaluating attempts to reintroduce sea otters along the California coastline. *Endangered Species Update* 13(12): 31-35.
- Brueggeman, J.J. (ed.). 1992. Oregon and Washington Marine Mammal and Seabird Surveys. OCS Study MMS 91-0093, prepared for Minerals Management Service, Pacific OCS Region U.S. DOI, Los Angeles, CA.
- Carretta, J.V., M.S. Lynn and C.A. LeDuc. 1994. Right whale (*Eubalaena glacialis*) sighting off San Clemente Island, California. *Marine Mammal Science* 19 (1): 101-105.
- Dorsey, E.M., S.J. Stern, A.R. Hoelzel and J. Jacobsen. 1990. Minke whales (*Balaenoptera acutorostrata*) from the West Coast of North America: individual recognition and small-scale site fidelity. *Report of the International Whaling Commission*, Special Issue 12: 357-368.
- Forney, K.A., J. Barlow and J.V. Carretta. 1995. The abundance of cetaceans in California waters. Part II: Aerial surveys in winter and spring of 1991 and 1992. *Fishery Bulletin* 93: 15-26.
- Gagnon, G.J. and C.W. Clark. 1993. The use of U.S. Navy IUSS passive sonar to monitor the movement of blue whales. Abstract, Tenth Biennial Conference on the Biology of Marine Mammals, Galveston, TX, 11-15 November 1993.
- Hill, P.S., D.P. DeMaster and R.J. Small. 1997. Alaska Marine Mammal Stock Assessments, 1996. NOAA -TM -NMFS-AFSC-78, 150 pp.
- Hobbs, R.C., D.J. Rugh, J.M. Waite, J.M. Breiwick and D.P. DeMaster. in press. Preliminary estimate of the abundance of gray whales in the 1995/1996 southbound migration. *Report of the International Whaling Commission*, Special Issue #: xx-xx.
- Jefferson, T.A. 1996. Estimates of abundance of cetaceans in offshore waters of the northwestern Gulf of Mexico, 1992-1993. *The Southwestern Naturalist* 41(3): 279-287.
- Jefferson, T.A. and A.J. Schiro. 1997. Distribution of cetaceans in the offshore Gulf of Mexico. *Mammal Review* 27(1): 27-50.
- Leatherwood, S., R.R. Reeves and L. Foster. 1983. The Sierra Club Handbook of Whales and Dolphins. Sierra Club Books, San Francisco, CA.

- McGinnis, C. and D. Pruitt. 1997. Integrated Natural Resources Planning: Ecosystem Management on a Coastal Air Force Base. Abstract, California and the World Ocean '97: Session D3, San Diego, CA (Abstracts available from: The Coastal Zone Foundation, P.O. Box 279, Middletown, CA 95461).
- Reeves, R.R., B.S. Stewart and S. Leatherwood. 1992. *The Sierra Club Handbook of Seals and Sirenians*. Sierra Club Books, San Francisco, CA.
- Ridgway, S.H. and R. Harrison (eds.). 1985. *Handbook of Marine Mammals*, Vol. 3: the Sirenians and Baleen Whales. Academic Press, Inc. London, UK.
- Ridgway, S.H., and R. Harrison (eds.). 1989. *Handbook of Marine Mammals*, Vol 4: River Dolphins and the Larger Toothed Whales. Academic Press, Inc. London, UK.
- Stafford, K.M. 1995. Characterization of blue whale calls from the Northeast Pacific and development of a matched filter to locate blue whales on U.S. Navy SOSUS (SOund SURveillance System) arrays. Master of Science Thesis, submitted to Oregon State University, January 1995.
- Stafford, K.M. and C.G. Fox. 1998. A comparison of the acoustic signals produced by blue whales (*Balaenoptera musculus*) in the North Pacific and their use in stock definition/differentiation. Abstracts World Marine Mammal Science Conference, Monaco: 127-128.
- Stenson, G.B. 1993. The status of pinnipeds in the Newfoundland region. NAFO SCR Document 93/34.
- USFWS. 1995. West Indian Manatee: *Trichechus manatus*. U.S. Fish and Wildlife Service, Jacksonville, Florida.
- Waring, G.T., D.L. Palka, K.D. Mullin, J.H.W. Hain, L.J. Hansen and K.D. Bisack. 1997. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 1996. NOAA Technical Memorandum NMFS-NE-114, 250 pp.
- Watkins, W.A. and K.E. Moore. 1982. An underwater acoustic survey for sperm whales (*Physeter catodon*) and other cetaceans in the southeast Caribbean. *Cetology* 46: 1-7.

APPENDIX

SANCTUARIES AND RESERVES SUMMARY TABLES

Contents

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OVERVIEW

This appendix presents information on a representative sample of coastal sanctuaries and reserves from each of the five regions of interest to the Air Force. Note that this is not a comprehensive list. There are sanctuaries and reserves that have not been included in this appendix for assorted reasons, including small geographic size, purpose or mission, and/or lack of information. This appendix is intended to acquaint Air Force personnel with the varied and numerous natural areas found along the coastlines of the contiguous United States and some of the marine animals that occur within them. Information in this appendix will aid planning and mitigation of various Air Force activities.

Many sanctuaries and reserves have been set aside specifically for protection of marine animals by providing critical habitat for feeding, nesting, mating and/or migrating. Many are multiple use areas in which some marine animals are protected and other marine animals are not. Some provide seasonal habitat only. Nearly all of the sanctuaries and reserves are administered by federal, state or local governments. Individuals desiring supplementary information about any of these areas should use the reference list as a starting point for additional inquiry.

The data fields included in the sanctuary and reserves tables are as follows:

Region	Identifier cross-referenced to species table in main report
Name	Name of sanctuary or reserve
Letter design	Letter identifier cross-referenced to specific sanctuary map
Size (acres)	Approximate size (where known)
Habitat types	Dominant habitat type(s) represented in sanctuary
Listed marine animals	Marine mammal, seabird and sea turtle species that are Federally listed as endangered or threatened
Special comments	Additional information pertaining to sanctuary (where necessary)
Info sources	Number designator cross-referenced to list of references
Admin	Agency responsible for administration of sanctuary
Street address	Street address for agency
City	City for agency
ST	State for agency
Zip	Zip code
Phone #	Area code plus phone number for agency

NORTHEAST PACIFIC

Washington Sanctuaries

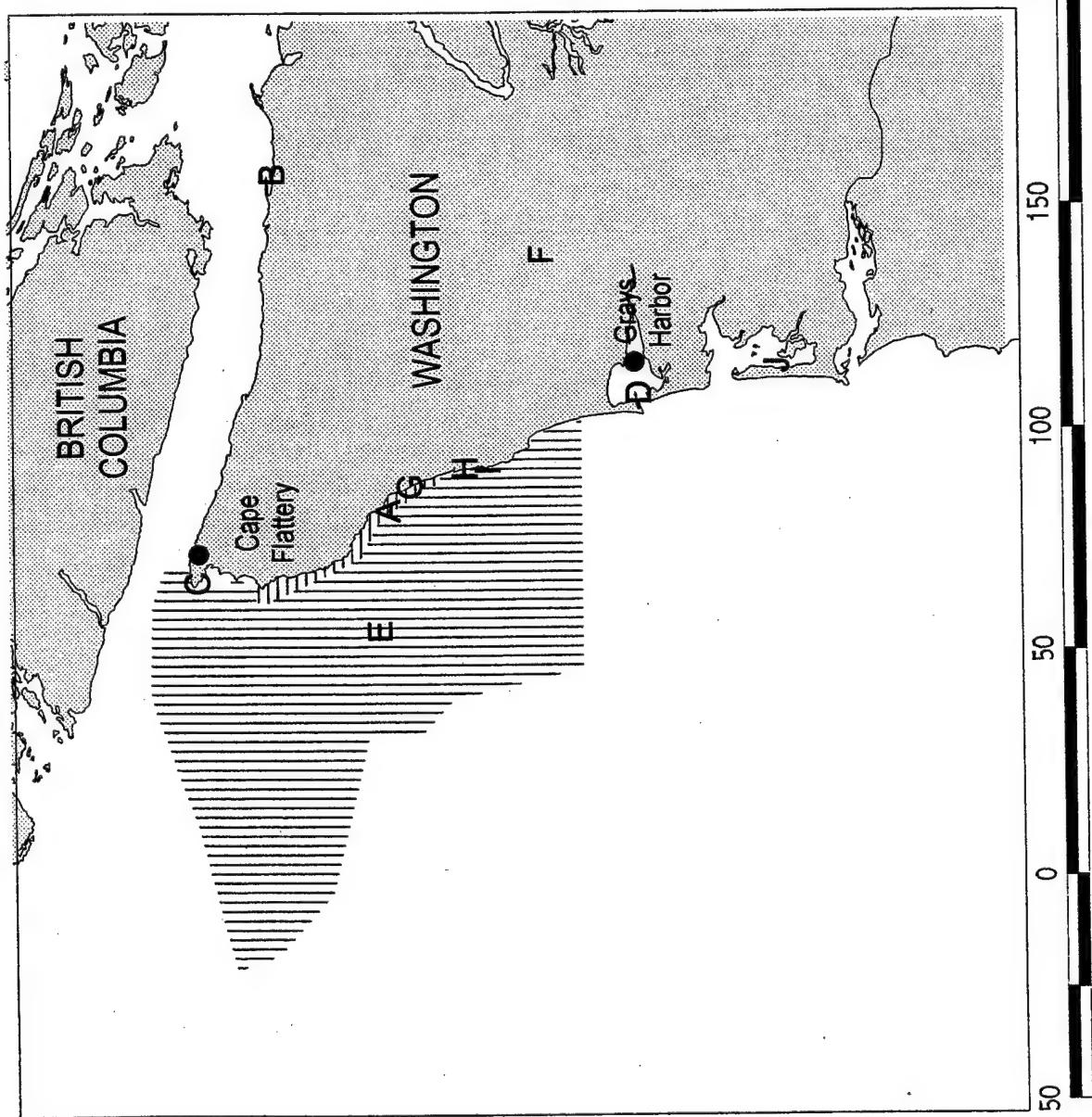


Table 1. Washington sanctuaries and reserves.

Region	Name	Letter Design	Habitat Types (acres)	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	State	Zip Code	Phone #
NE Pac: WA	Copalis National Wildlife Refuge	A	rocky islands, rocky intertidal	Steller sea lion, CA sea otter, Brandt's cormorant		6	US Fish and Wildlife Service	c/o Nisqually NWR, 100 Brown Farm Rd	Olympia	VWA	98516	360 753 8467
NE Pac: WA	Dungeness Spit Wildlife Refuge	B	631 sandy shore, salt marsh, forest	Steller sea lion, blue whale, fin whale, humpback whale, sei whale, sperm whale, brown pelican, marbled murrelet		12	State of Washington	1638 Barr Road South	Port Angeles	VWA	98382	206 457 8451
NE Pac: WA	Flatirons Rocks National Wildlife Refuge	C	rocky islands, rocky intertidal	Steller sea lion, CA sea otter, Brandt's cormorant		8	US Fish and Wildlife Service	c/o Nisqually NWR, 100 Brown Farm Rd	Olympia	VWA	98516	360 753 8467
NE Pac: WA	Gray's Harbor National Wildlife Refuge	D	salt marsh	brown pelican		8	US Fish and Wildlife Service	c/o Nisqually NWR, 100 Brown Farm Rd	Olympia	VWA	98516	360 753 8467
NE Pac: WA	Olympic Coast National Marine Sanctuary	E	rocky intertidal, kelp forest	marbled murrelet		5	NOAA Sanctuaries and Reserves Division	138 West First St	Port Angeles	VWA	98362	360 457 6822
NE Pac: WA	Olympic National Forest	F	632000 forest	marbled murrelet		10,11	US Forest Service	1835 Black Lake Blvd SW	Olympia	VWA	98512-6798	360 958 2400
NE Pac: WA	Olympic National Park	G	forest	northern right whale, blue whale, fin whale, sei whale, humpback whale, sperm whale, gray whale, Steller sea lion, CA sea otter, harbor porpoise, brown pelican, Brandt's cormorant, Aleutian Canada Goose, marbled murrelet		9, 10	National Park Service	600 East Park Ave	Port Angeles	VWA	98362-6798	360 452 4501
NE Pac: WA	Quillayutes Needles	H	rocky islands, rocky intertidal	Steller sea lion, CA sea otter, Brandt's cormorant		6	US Fish and Wildlife Service	c/o Nisqually NWR, 100 Brown Farm Rd	Olympia	VWA	98516	360 753 8467
NE Pac: WA	Washington Islands Wilderness Area	I	450 rocky islands, rocky intertidal	Steller sea lion, CA sea otter, Brandt's cormorant		6	US Fish and Wildlife Service	c/o Nisqually NWR, 100 Brown Farm Rd	Olympia	VWA	98516	360 753 8467
NE Pac: WA	Willapa National Wildlife Refuge	J	5600 forest, tidal flats, freshwater marsh	brown pelican		6	US Fish and Wildlife Service	Box 910	Ilwaco	VWA	98824	360 484 3482

Oregon Sanctuaries

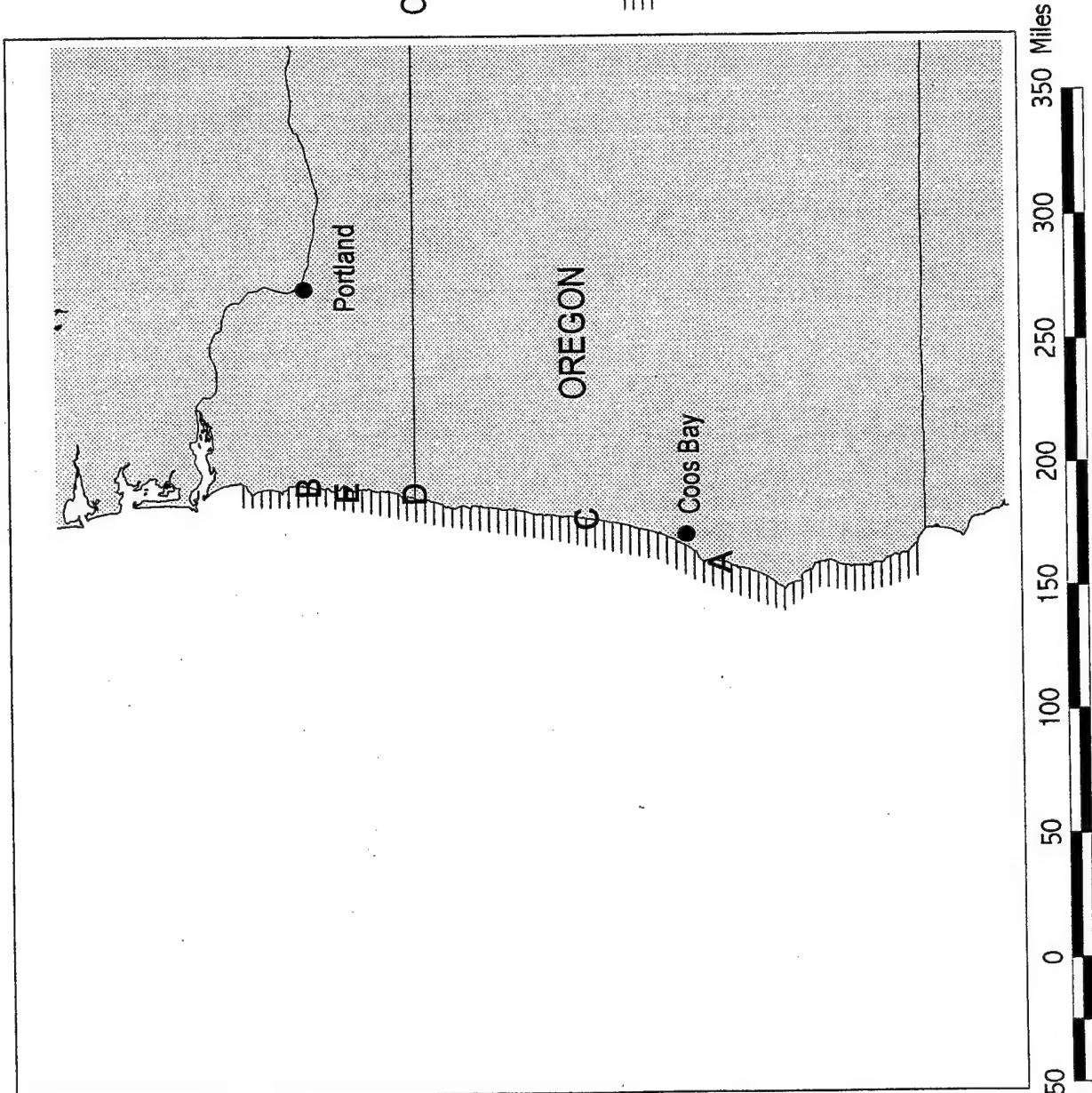


Table 2. Oregon sanctuaries and reserves.

Region	Name	Letter Design	Size (acres)	Habitat Types	Listed Marine Animals	Special Comments	Sources	Info	Admin	Street Address	City	ST	Zip	Phone #
NE Pac: OR	Bandon Marsh National Wildlife Refuge	A	289	salt marsh	brown pelican		6	US Fish and Wildlife Service	Western Oregon Complex, 26208 Finley Refuge Rd.	Concordia	OR	97333	541 757 7236	
NE Pac: OR	Cape Meares National Wildlife Refuge	B		forest	marbled murrelet		6	US Fish and Wildlife Service	Western Oregon Complex, 26208 Finley Refuge Rd.	Concordia	OR	97333	541 757 7236	
NE Pac: OR	Oregon Islands National Wildlife Refuge	C	575	rocky islands, rocky intertidal	Steller sea lion, brown pelican		6	US Fish and Wildlife Service	Western Oregon Complex, 26208 Finley Refuge Rd.	Concordia	OR	97333	541 757 7236	
NE Pac: OR	Steller Bay National Wildlife Refuge	D	46	salt marsh	brown pelican		6	US Fish and Wildlife Service	Western Oregon Complex, 26208 Finley Refuge Rd.	Concordia	OR	97333	541 757 7236	
NE Pac: OR	Three Arch Rocks National Wildlife Refuge	E	17	rocky island	Steller sea lion, brown pelican		6	US Fish and Wildlife Service	Western Oregon Complex, 26208 Finley Refuge Rd.	Concordia	OR	97333	541 757 7236	

SOUTHEAST PACIFIC

Mid-California Sanctuaries

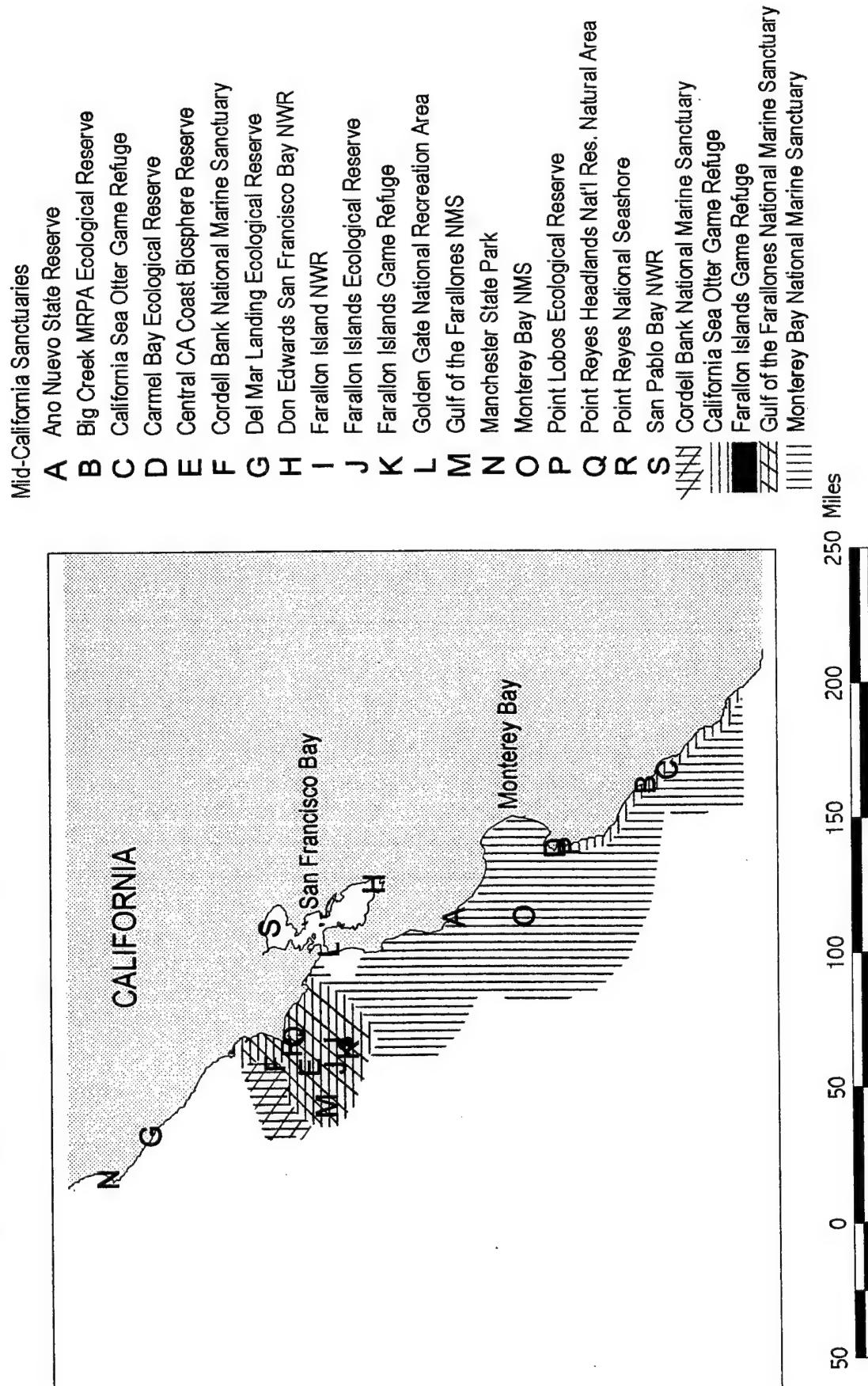


Table 3. Mid-California sanctuaries and reserves.

Region	Name	Letter Design	Habitat Type(s)	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
SE Pac: mid-CA	Ano Nuevo State Reserve	A	sandy shore, rocky Islands	Steller sea lion brown pelican	harassment and disturbance of wild animals prohibited	6	CA Dept Parks and Recreation	New Years Creek Rd	Pescadero	CA	94050	415 879 2025
SE Pac: mid-CA	Big Creek Marine Resources Protection Act Ecological Reserve	B	1674 rocky intertidal, kelp forest	brown pelican	no aircraft except by authorized research permit	1	CA Dept of Fish and Game	1418 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: mid-CA	California Sea Otter Game Refuge	C	182300 sandy shore, kelp forest	sea otter	no aircraft <1000' except by permit	1,2	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: mid-CA	Carmel Bay Ecological Reserve	D	1652 rocky intertidal, kelp forest	sea otter	no aircraft except by authorized research permit	7	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: mid-CA	Central CA Coast Biosphere Reserve	E	1000012 tidal flats, reefs, littoral ocean, tidal flats/salt marsh, deep benthos	blue, fin, humpback and sperm whales, and Steller sea lions		1						
SE Pac: mid-CA	Concord Bank National Marine Sanctuary	F	332400 seamount, rocky intertidal,	blue, fin, humpback and sperm whales		1,2,5	NOAA Sanctuaries and Reserves Division	Fort Mason Building #201	San Francisco	CA	94123	415 556 3509
SE Pac: mid-CA	DelMar Landing Ecological Reserve	G	60 rocky intertidal		no aircraft except by authorized research permit	6	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: mid-CA	Don Edwards San Francisco Bay National Wildlife Refuge	H	salt marsh	brown pelican, CA least tern		6	US Fish and Wildlife Service	San Francisco Bay Complex, P.O. Box 524	Newark	CA	94560	510 792 0222
SE Pac: mid-CA	Farallon Islands National Wildlife Refuge	I	211 rocky islands	Steller sea lion, brown pelican		6	US Fish and Wildlife	PO Box 524	Newark	CA	94560	415 792 0222
SE Pac: mid-CA	Farallon Islands Ecological Reserve	J	rocky islands	Steller sea lion		6	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: mid-CA	Farallon Islands Game Refuge	K	11262 rocky islands	Steller sea lion	no helicopter <1000' except by permit	1	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: mid-CA	Golden Gate National Recreation Area	L	5885 sandy shore, rocky intertidal, tidal flats/salt marsh	blue, fin, humpback and sperm whales, and Steller sea lions		9	National Park Service	Fort Mason Building #201	San Francisco	CA	94123	
SE Pac: mid-CA	Gulf of the Farallones National Marine Sanctuary	M	792604 tidal flats, reefs, littoral ocean, tidal flats/salt marsh, deep benthos	blue, fin, humpback and sperm whales, and Steller sea lions	no aircraft <1000' except by permit	1,2,5	NOAA Sanctuaries and Reserves Division	Fort Mason Building #201	San Francisco	CA	94123	415 556 3509
SE Pac: mid-CA	Manchaciet State Park/Arena Rock Marine Natural Preserve	N	3857 sandy shore, kelp forest	unk		1	CA Dept of Parks and Recreation	PO Box 440	Mendocino	CA	95460	707 882 2463
SE Pac: mid-CA	Monterey Bay National Marine Sanctuary	O	336879 submarine canyon, rocky intertidal, kelp forest, sandy shore	blue, fin, humpback, right whale, sperm whales, Steller sea lions, Guadalupe fur seals, sea otters, brown pelicans and marbled murrelets		1,2,3	NOAA Sanctuaries and Reserves Division	299 Faam St., #D	Monterey	CA	93840	408 647 4201
SE Pac: mid-CA	Point Lobos Ecological Reserve	P	775 kelp forest, rocky intertidal	sea otter	no aircraft except by authorized research permit	8	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: mid-CA	Point Reyes Headlands National Research Area	Q	640 intertidal			6						
SE Pac: mid-CA	Point Reyes National Seashore	R	8000 tidal flats, sandy shore	blue, fin, humpback, sei and sperm whales, Steller sea lions, sea otters, brown pelicans, Townsend's shearwaters, and least terns		1	National Park Service		Pt. Reyes Station			415 663 1092
SE Pac: mid-CA	San Pablo Bay National Wildlife Refuge	S	salt marsh/tidal flat	brown pelican, CA least tern		6	US Fish and Wildlife Service	PO Box 2012	Vallejo	CA	94592	707 552 6213

Southern California Sanctuaries

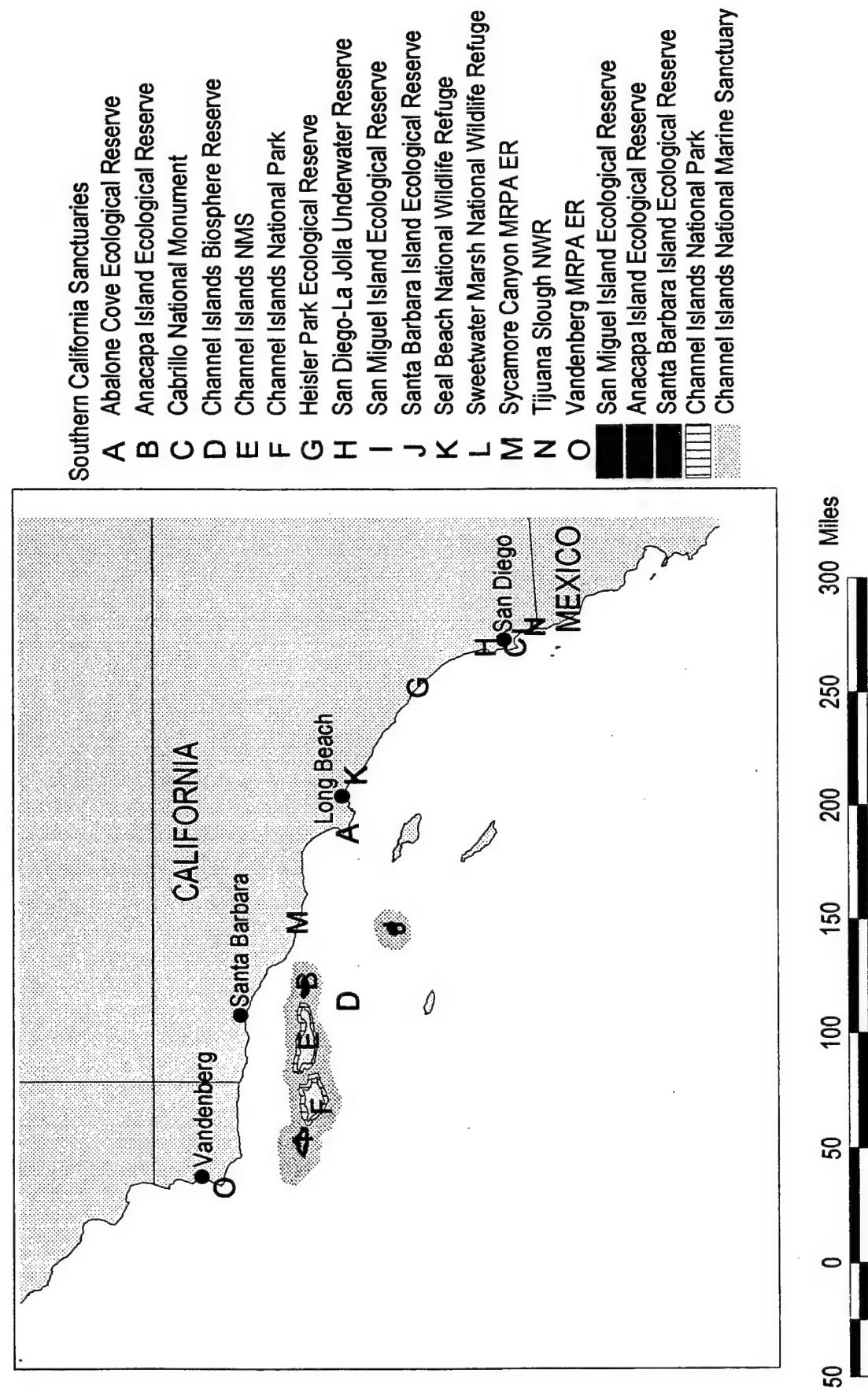


Table 4. Southern California sanctuaries and reserves.

Region	Name	Letter Design	Habitat Type*	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
SE Pac: So CA Reserve	Abalone Cove Ecological Reserve	A	rocky intertidal, kelp forest	brown pelican	no aircraft except by permit	8	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: So CA Reserve	Anacapa Island Ecological Reserve	B	rocky intertidal, kelp forest, rocky islands	brown pelican	no aircraft except by permit	1,8	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: So CA Monument	Cabrillo National Monument	C	rocky intertidal, kelp forest			9	National Park Service	1800 Cabrillo Memorial Drive	San Diego	CA	92106-3601	619 567 5450
SE Pac: So CA Reserve	Channel Islands Biosphere Reserve	D	rocky islands, rocky intertidal, kelp forest	blue, sei, fin, humpback, right and sperm whale, Stellar sea lion, Guadalupe fur seal and brown pelican	blue, sei, fin, humpback, right and sperm whale, Stellar sea lion, Guadalupe fur seal and brown pelican	1			CA			
SE Pac: So CA Reserve	Channel Islands National Marine Sanctuary	E	kelp forest, littoral ocean, rocky islands, sandy shore		no aircraft within 1000'	12,4	NOAA Sanctuaries and Reserves Division	1113 Harbor Way	Santa Barbara	CA	93109	805 966 7107
SE Pac: So CA Park	Channel Islands National Park	F	rocky islands, rocky intertidal, kelp forest			1,9	National Park Service, State of CA	1901 Spinnaker Dr.	Ventura	CA	93001	805 656 5730
SE Pac: So CA Reserve	Heisler Park Ecological Reserve	G	sandy shore, kelp forest	brown pelican	no aircraft except by permit	8	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: So CA Underwater Reserve	San Diego-a Jolla Underwater Reserve	H	kelp forest		no aircraft except by permit	1	City of La Jolla, Dept of Parks and Recreation	2581 Quivira Ct.	San Diego	CA	92109	619 221 8866
SE Pac: So CA Reserve	San Miguel Island Ecological Reserve	I	kelp forest, rocky intertidal	Stellar sealion, Guadalupe fur seal	no aircraft except by permit	1,8	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: So CA Reserve	Santa Barbara Island Ecological Reserve	J	kelp forest, rocky intertidal	brown pelican	no aircraft except by permit	1	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: So CA National Wildlife Refuge	Seal Beach National Wildlife Refuge	K	salt marsh	brown pelican, CA least tern		6	US Fish and Wildlife Service	San Diego Complex, 2735 Loker Ave. West	Carlsbad	CA	92008	760 930 0168
SE Pac: So CA Refuge	Sweetwater Marsh National Wildlife Refuge	L	salt marsh/tidal flat	CA least tern		6	US Fish and Wildlife Service	San Diego Complex, 2735 Loker Ave. West	Carlsbad	CA	92008	760 930 0168
SE Pac: So CA Reserve	Sycamore Canyon Marine Resources Protection Act Ecological Reserve	M	kelp forest, rocky intertidal	brown pelican, CA least tern		1	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281
SE Pac: So CA Reserve	Tijuana Slough National Wildlife Refuge	N	salt marsh/tidal flat	brown pelican, CA least tern		6	US Fish and Wildlife Service	301 Caspian Way	Imperial Beach	CA	91932	619 575 2704
SE Pac: So CA Reserve	Vanderberg Marine Resources Protection Act Ecological Reserve	O	kelp forest, rocky intertidal	brown pelican, CA least tern		1	CA Dept of Fish and Game	1416 Ninth St.	Sacramento	CA	95814	916 653 6281

GULF OF MEXICO

Texas Sanctuaries

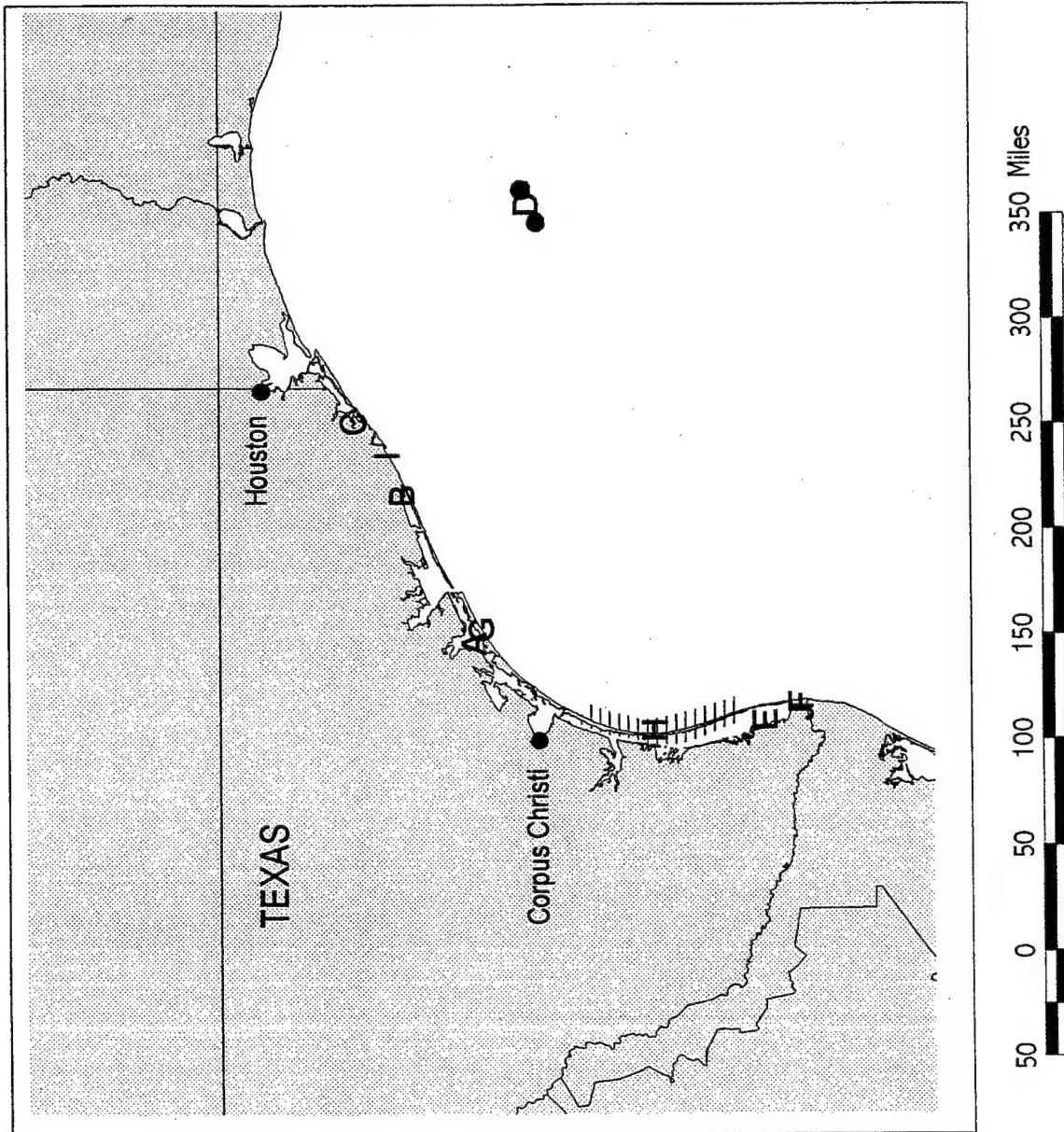


Table 5. Texas sanctuaries and reserves.

Region	Name	Letter Design	Size (acres)	Habitat Types	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
Gulf of Mex. TX Refuge	Aransas National Wildlife Refuge	A		salt marsh	green, hawksbill, Kemp ridley, loggerhead and leatherback sea turtles, brown pelicans		6	U.S. Fish and Wildlife Service	PO Box 100	Austwell	TX	77950	512 286 3559
Gulf of Mex. TX Refuge	Big Boggy National Wildlife Refuge	B	4536	salt marsh	brown pelican		6	U.S. Fish and Wildlife Service	c/o Brazosna NWR, 1212 N. Velasco, Suite 200	Angleton	TX	77515	409 964 3639
Gulf of Mex. TX Refuge	Gulf of Brazoria National Wildlife Refuge	C	40854	salt marsh, freshwater marsh	brown pelican		6	U.S. Fish and Wildlife Service	c/o Brazosna NWR, 1212 N. Velasco, Suite 200	Angleton	TX	77515	409 849 7770
Gulf of Mex. TX Refuge	Laguna Atascosa National Wildlife Refuge	D	45187	salt marsh, freshwater marsh	loggerhead sea turtles, brown pelican		6	U.S. Fish and Wildlife Service	PO Box 450	Rio Hondo	TX	78583	210 748 3607
Gulf of Mex. TX Refuge	Lower Rio Grande Valley National Wildlife Refuge	E		sandy shore, salt marsh, freshwater marsh	green, hawksbill, Kemp ridley, loggerhead and leatherback sea turtles, brown pelicans		6	U.S. Fish and Wildlife Service	c/o Lower Rio Grande Valley/Santa Ana Complex, Route 2, Box 202A	Alamo	TX	78516	210 787 3079
Gulf of Mex. TX Marine Sanctuary	Flower Garden National Marine Sanctuary	F		reefs	loggerhead sea turtles		5	NOAA Sanctuaries and Reserves Division	216 W. 25th St., Suite 104	Bryan	TX	77803	409 779 2705
Gulf of Mex. TX Park and Wildlife Management Area	Matagoripa Island State Park and Wildlife Management Area	G	43893	sandy shore	Atlantic ridley sea turtle, brown pelican		21	Texas Parks and Wildlife Department	PO Box 117	Port O'Connor	TX	77982	512 983 2215
Gulf of Mex. TX Padre Island National Seashore	H	133000	sandy shore	Atlantic ridley and loggerhead sea turtles, brown pelican			9	National Park Service Drive	9405 South Padre Island	Corpus Christi	TX	78418	512 949 8173
Gulf of Mex. TX San Bernard National Wildlife Refuge	I	24455	salt marsh, freshwater marsh	brown pelican			6	U.S. Fish and Wildlife Service	c/o Brazosna NWR, 1212 N. Velasco, Suite 200	Angleton	TX	77515	409 849 7770
Gulf of Mex. TX Santa Ana National Wildlife Refuge	J		sandy shore, salt marsh, freshwater marsh	brown pelican		6.22	U.S. Fish and Wildlife Service	c/o Lower Rio Grande Valley/Santa Ana Complex, Route 2, Box 202A	Alamo	TX	78516	210 787 3079	

Louisiana, Mississippi and Alabama Sanctuaries

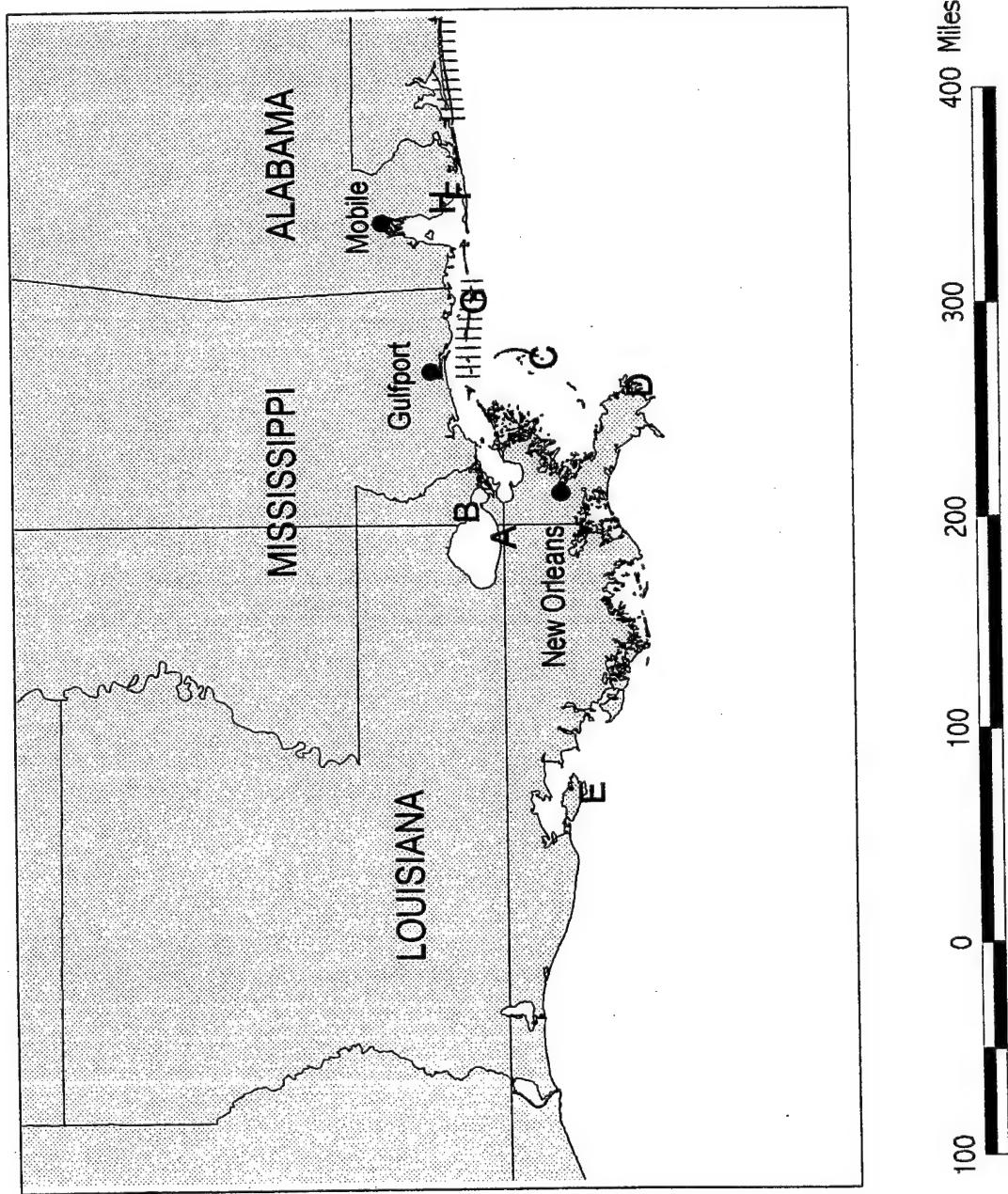


Table 6. Louisiana, Mississippi and Alabama sanctuaries and reserves.

Region	Name	Letter Design	Size (acres)	Habitat Types	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
Gulf of Mex: LA	Bayou Sauvage National Wildlife Refuge	A	salt marsh, freshwater marsh	brown pelican			6 U.S. Fish and Wildlife Service	c/o Southeast Louisiana Refugees, 1010 Gause Blvd., Bldg 936	Slideell	LA	70458	504 646 7555	
Gulf of Mex: LA	Big Branch Marsh National Wildlife Refuge	B	3860	freshwater marsh	brown pelican		6 U.S. Fish and Wildlife Service	c/o Southeast Louisiana Refugees, 1010 Gause Blvd., Bldg 936	Slideell	LA	70458	504 646 7555	
Gulf of Mex: AL	Bon Secour National Wildlife Refuge	F		salt marsh, freshwater marsh, sandy shore	loggerhead sea turtles		6 U.S. Fish and Wildlife Service	12295 State Hwy 180	Gulf Shores	AL	36542	334 540 7720	
Gulf of Mex: LA	Bretton National Wildlife Refuge	C	6923	sandy shore, salt marsh	Green, Kemp ridley, leatherback and loggerhead sea turtles, brown pelican and least tern		6 U.S. Fish and Wildlife Service	c/o Southeast Louisiana Refugees, 1010 Gause Blvd., Bldg 936	Slideell	LA	70458	504 646 7555	
Gulf of Mex: LA	Delta National Wildlife Refuge	D	48800	freshwater marsh, salt marsh	brown pelican		6 U.S. Fish and Wildlife Service	3500 Park Road	Ocean Springs	MS	39564	601 875 0821	
Gulf of Mex: MS	Gulf Islands National Seashore	G	135625	salt marsh, sandy shore	brown pelican		9,12 National Park Service	c/o Southeast Louisiana Refugees, 1010 Gause Blvd., Bldg 936	Slideell	LA	70458	504 646 7555	
Gulf of Mex: LA	Shell Keys National Wildlife Refuge	E		sandy shore	brown pelican		6 U.S. Fish and Wildlife Service	11300 US Highway 98	Fairhope	AL	36532	334 928 9792	
Gulf of Mex: AL	Weeks Bay National Estuarine Research Reserves	H	>3000	salt marsh, sandy shore	brown pelican		20 NOAA Sanctuaries and Reserves Division and AL Dept. Economic and Community Affairs						

Florida Gulf of Mexico Sanctuaries

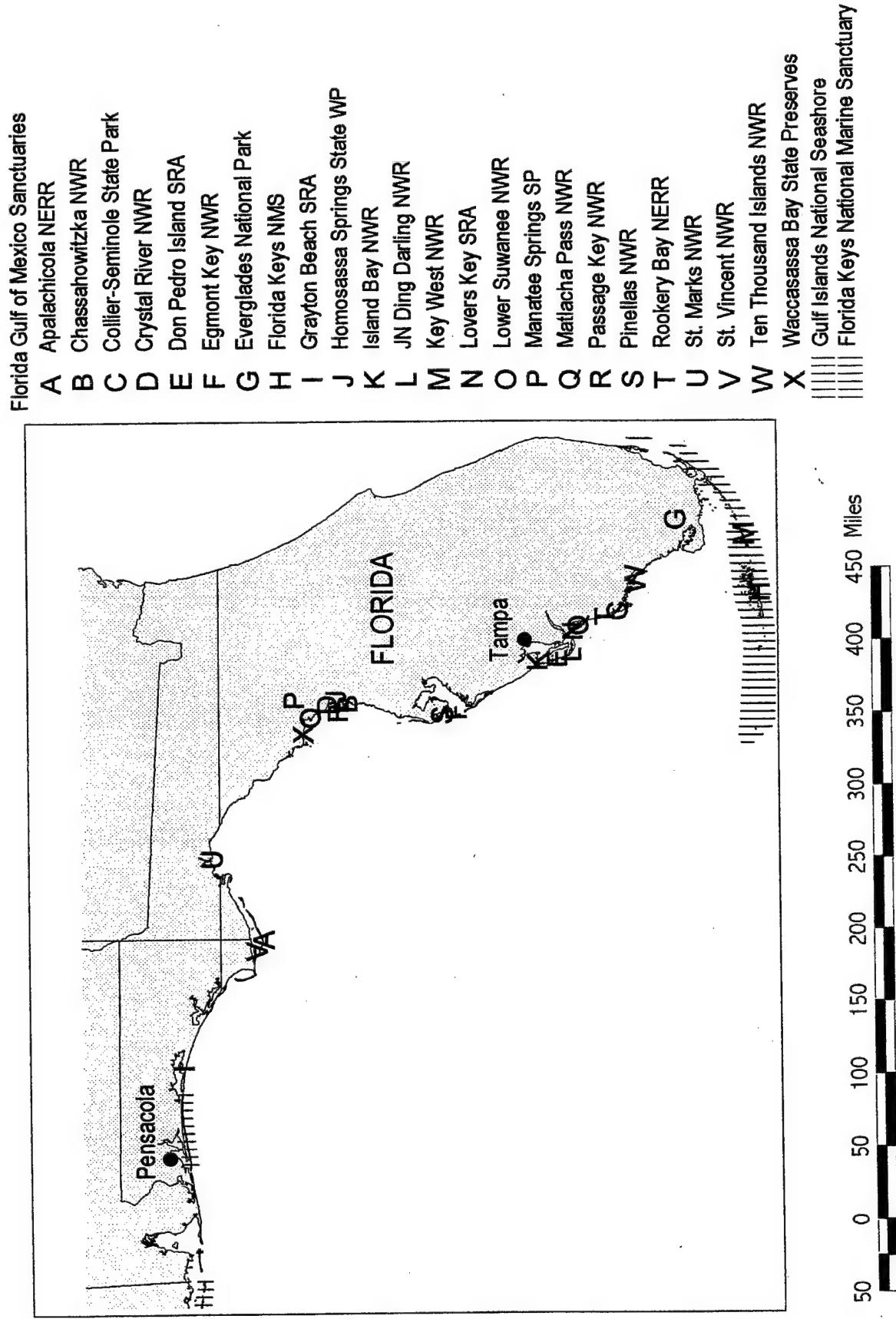


Table 7. Florida (Gulf of Mexico) sanctuaries and reserves.

Region	Name	Letter Design	Size (acres)	Habitat Types	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
Gulf of Mexico: FL	Apalachicola National Estuarine Research Reserves	A	193758	salt marsh, sandy shore	manatees, green, Atlantic Ridley, leatherback and loggerhead sea turtles		19	Florida Dept of Environmental Protection, and NOAA	261 7th Street	Apalachicola	FL	32320	904 653 8063
Gulf of Mexico: FL	Chassahowitzka National Wildlife Refuge	B	30,500	salt marsh	manatees, green, Kemp Ridley and loggerhead sea turtles		6	U.S. Fish and Wildlife Service	c/o Chassahowitzka NWR, 1502 SE Kings Bay Drive	Crystal River	FL	34429	352 563 2088
Gulf of Mexico: FL	Collier-Seminole State Park	C		salt marsh	manatees		13	Florida State Parks	20200 E. Tamiami Trail	Naples	FL	34114	941 394 3397
Gulf of Mexico: FL	Crystal River National Wildlife Refuge	D	43	freshwater marsh	manatees		6	U.S. Fish and Wildlife Service	1502 SE Kings Bay Drive	Crystal River	FL	34429	352 563 2088
Gulf of Mexico: FL	Don Pedro Island State Recreation Area	E		sandy shore	loggerhead sea turtles		24	Florida State Parks	c/o Cayo Costa State Park, P.O. Box 1150	Boca Grande	FL	33921	941 564 0375
Gulf of Mexico: FL	Egmont Key National Wildlife Refuge	F	350	sandy shore, saltmarsh	loggerhead sea turtles		6	U.S. Fish and Wildlife Service	c/o Chassahowitzka NWR, 1502 SE Kings Bay Drive	Crystal River	FL	34429	352 563 2088
Gulf of Mexico: FL	Everglades National Park	G	1506539	salt marsh, freshwater marsh, mangroves	manatees		9,12	National Park Service	40001 State Road 9336	Homestead	FL	33034-6733	305 242 7700
Gulf of Mexico: FL	Florida Keys National Marine Sanctuary	H		mangroves, coral reef			5,12	NOAA Sanctuaries and Reserves Division	P.O. Box 500368	Marathon	FL	33050	305 743 2437
Gulf of Mexico: FL	Grayton Beach State Recreation Area	I	400	sandy shore	sea turtles		24	Florida State Parks	Box 6600	Santa Rosa Beach	FL	32459	904 231 4210
Gulf of Mexico: FL	Homosassa Springs State Wildlife Park	J		freshwater marsh	manatees		24	Florida State Parks	9225 West Fish Bowl Drive	Homosassa	FL	34448	352 628 5343
Gulf of Mexico: FL	Island Bay National Wildlife Refuge	K		mangroves, salt marsh	manatees		6	U.S. Fish and Wildlife Service	c/o JN Ding Darling NWR, 1 Wildlife Drive	Sanibel	FL	33957	941 472 1100

Table 7. (Cont.)

Region	Name	Letter Design	Habitat Types	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
Gulf of Mexico: FL	JN Ding Darling National Wildlife Refuge	L	mangrove, freshwater marsh	manatees		6 U.S. Fish and Wildlife Service	JN Ding Darling NWR, 1 Wildlife Drive	Sanibel	FL	33957	941 472 1100	
Gulf of Mexico: FL	Key West National Wildlife Refuge	M	salt marsh, mangrove	green sea turtles, loggerhead sea turtles, roseate terns		6 U.S. Fish and Wildlife Service	c/o National Key Deer Refuge, PO Box 430510	Big Pine Key	FL	33043-0510	305 872 2239	
Gulf of Mexico: FL	Lovers Key State Recreation Area	N	434 mangroves	manatees		24 Florida State Parks	8700 Estero Blvd.	Ft. Myers Beach	FL	33931	941 463 4588	
Gulf of Mexico: FL	Lower Suwanee National Wildlife Refuge	O	saltmarsh, freshwater marsh	manatees, loggerhead and Kemp Ridley sea turtles		6 U.S. Fish and Wildlife Service	Roule 1, Box 1193-C	Chiefland	FL	32626	904 493 0238	
Gulf of Mexico: FL	Manatee Springs State Park	P	2075 freshwater marsh	manatees		24 Florida State Parks	Roule 2, Box 617	Chiefland	FL	32626	352 493 6072	
Gulf of Mexico: FL	Mataacha Pass National Wildlife Refuge	Q	148 mangrove	manatees		6 U.S. Fish and Wildlife Service	c/o JN Ding Darling NWR, 1 Wildlife Drive	Sanibel	FL	33957	941 472 1100	
Gulf of Mexico: FL	Passage Key National Wildlife Refuge	R	30 sandy shore, saltmarsh	green and loggerhead sea turtles		6 U.S. Fish and Wildlife Service	c/o Chassahowitzka NWR, 1502 SE Kings Bay Drive	Crystal River	FL	34428	352 563 2088	
Gulf of Mexico: FL	Pinellas National Wildlife Refuge	S	saltmarsh, sandy shore	manatees, green and loggerhead sea turtles		6 U.S. Fish and Wildlife Service	c/o Chassahowitzka NWR, 1502 SE Kings Bay Drive	Crystal River	FL	34429	352 563 2088	
Gulf of Mexico: FL	Rockery Bay National Estuarine Research Reserve	T	12500 saltmarsh	manatees		2.5 Florida Dept of Environmental Protection	10 Shell Island Road	Naples	FL	33962	941 775 8845	
Gulf of Mexico: FL	St. Marks National Wildlife Refuge	U	salt marsh/ridal flats, freshwater marsh	manatees, green, Kemp Ridley, leatherback and loggerhead sea turtles		6 U.S. Fish and Wildlife Service	PO Box 68	St. Marks	FL	32355	904 925 6121	
Gulf of Mexico: FL	St. Vincent National Wildlife Refuge	V	sandy shore	loggerhead sea turtles		6 U.S. Fish and Wildlife Service	PO Box 447	Apalachicola	FL	32328-0447	904 653 8808	
Gulf of Mexico: FL	Ten Thousand Islands National Wildlife Refuge	W	saltmarsh, freshwater marsh	manatees, green and loggerhead sea turtles		6 U.S. Fish and Wildlife Service	Florida Panther NWR, 3860 Tilgate Blvd., #300	Naples	FL	34114	941 353 8442	
Gulf of Mexico: FL	Waccasassa Bay State Preserve/Cedar Key Scrub State Preserve	X	30784 saltmarsh	manatees		24 Florida State Parks	P.O. Box 187	Cedar Key	FL	32625	352 543 5567	

SOUTHWEST ATLANTIC

Florida Atlantic Sanctuaries

- Florida Atlantic Sanctuaries
- A Amelia Island State Recreation Area
 - B Archie Carr NWR
 - C Big Talbot Isl. State Park
 - D Biscayne National Park
 - E Hobe Sound NWR
 - F John D. MacArthur Beach State Park
 - G Little Talbot Island State Park
 - H Merritt Island NWR/Canaveral NS
 - I Pelican Island NWR
 - J Right Whale Critical Habitat (FL/GA)
 - K St. Lucie Inlet State Preserve
 - Biscayne National Park
 - Archie Carr National Wildlife Refuge
 - Merritt Island National Wildlife Refuge
 - Right Whale Critical Habitat
 - Florida Keys National Marine Sanctuary

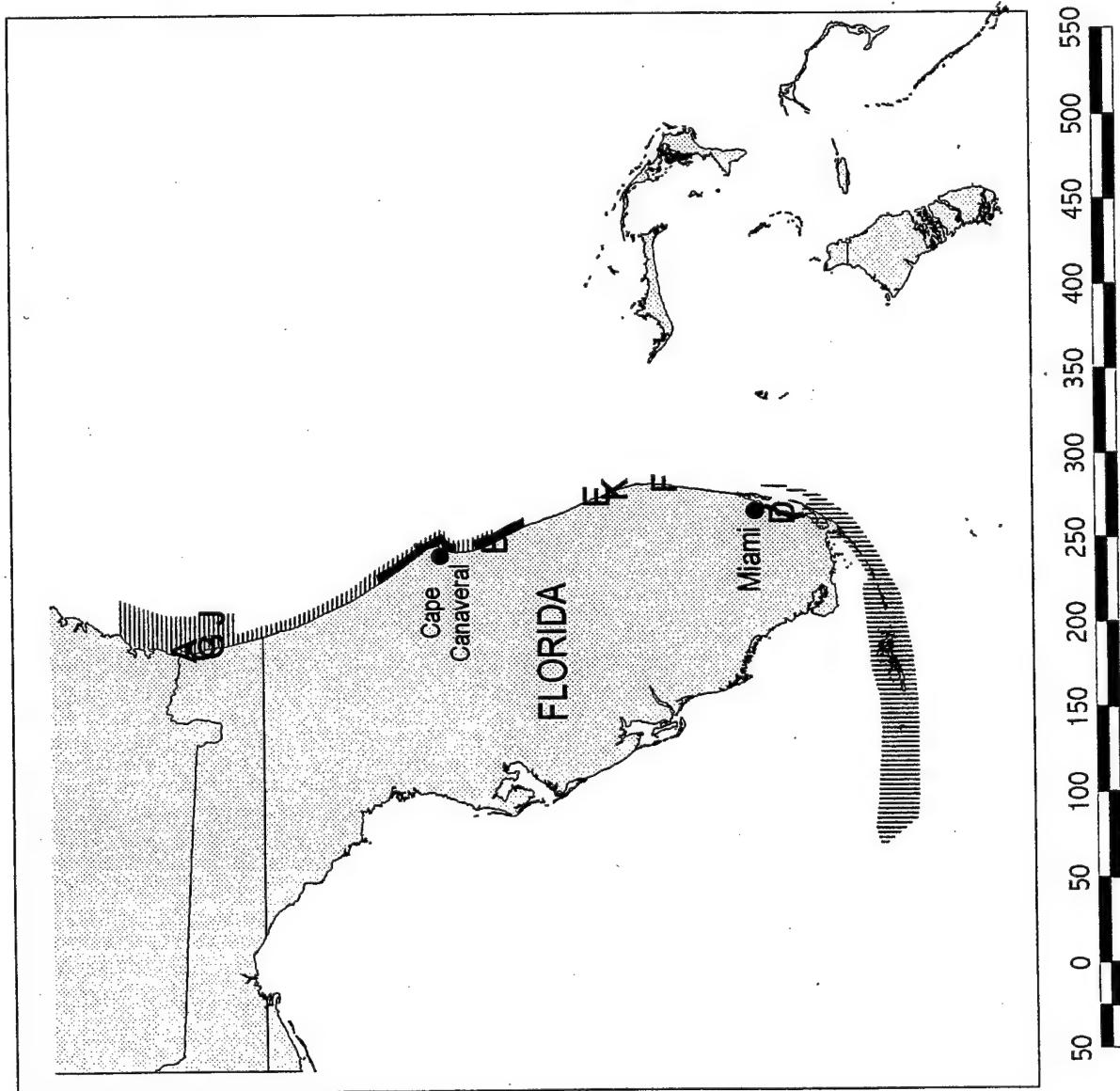


Table 8. Florida (Atlantic) sanctuaries and reserves.

Region	Name	Letter Design	Habitat Types	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
NW Ali: FL	Amelia Island State Recreation Area	A	>200 salt marsh, sandy shore			24	Florida State Parks	c/o The Talbot Islands GEOPark, 11435 Ft. George Road East	Ft. George	FL	32226	904 251 2320
NW Ali: FL	Archie Carr National Wildlife Refuge	B	sandy shore	loggerhead, green hawksbill and leatherback sea turtles		6	U.S. Fish and Wildlife Service					
NW Ali: FL	Big Talbot Island State Park	C	salt marsh, sandy shore			13	Florida State Parks	c/o The Talbot Islands GEOPark, 11435 Ft. George Road East	Titusville	FL	32796-3521	407 267 1110
NW Ali: FL	Biscayne National Park	D	181500 mangrove, coral reef	sea turtles, manatees		912	National Park Service	P.O. Box 1369	Ft. George	FL	32226	904 251 2320
NW Ali: FL	Hobe Sound National Wildlife Refuge	E	967 sandy shore, mangrove	green, loggerhead, and leatherback sea turtles, manatees, least tern		6	U.S. Fish and Wildlife Service	13640 SE Federal Highway	Hobe Sound	FL	33090-1369	305 230 7275
NW Ali: FL	John D. MacArthur Beach State Park	F	760 sandy shore, mangrove	loggerhead, green and leatherback sea turtles		13	Florida State Parks	10500 S.R. 703 (AIA)	North Palm Beach	FL	33408	407 624 6950
NW Ali: FL	Little Talbot Island State Park	G	salt marsh, sandy shore			13	Florida State Parks	c/o The Talbot Islands GEOPark, 11435 Ft. George Road East	Ft. George	FL	32226	904 251 2320
NW Ali: FL	Manatee Island National Wildlife Refuge/Canaveral National Seashore	H	tidal flats/saltmarsh, sandy shore	manatee, green, hawksbill, Kemp ridley, leatherback and loggerhead sea turtles, roseate spoonbills		6	U.S. Fish and Wildlife Service	c/o Merritt Island NWR, PO Box 6504	Titusville	FL	32782	417 861 0667
NW Ali: FL	Pelican Island National Wildlife Refuge	I	4760 sandy shore	manatees, green, hawksbill, Kemp Ridley, and loggerhead sea turtles		6	U.S. Fish and Wildlife Service					
NW Ali: FL	Right Whales Critical Habitat (FL/GA)	J	open ocean	northern right whales		16	National Marine Fisheries Service Office of Protected Resources	1335 East-West Highway	Silver Spring	MD	20910	301 713 2333
NW Ali: FL	St. Lucie Inlet State Preserve	K	sandy shore, mangrove	loggerhead, green and leatherback sea turtles		13	Florida State Parks	c/o Jonathan Dickinson State Park, 16450 S.E. Federal Highway	Hobe South	FL	33455	407 744 7603

South Carolina and Georgia Sanctuaries

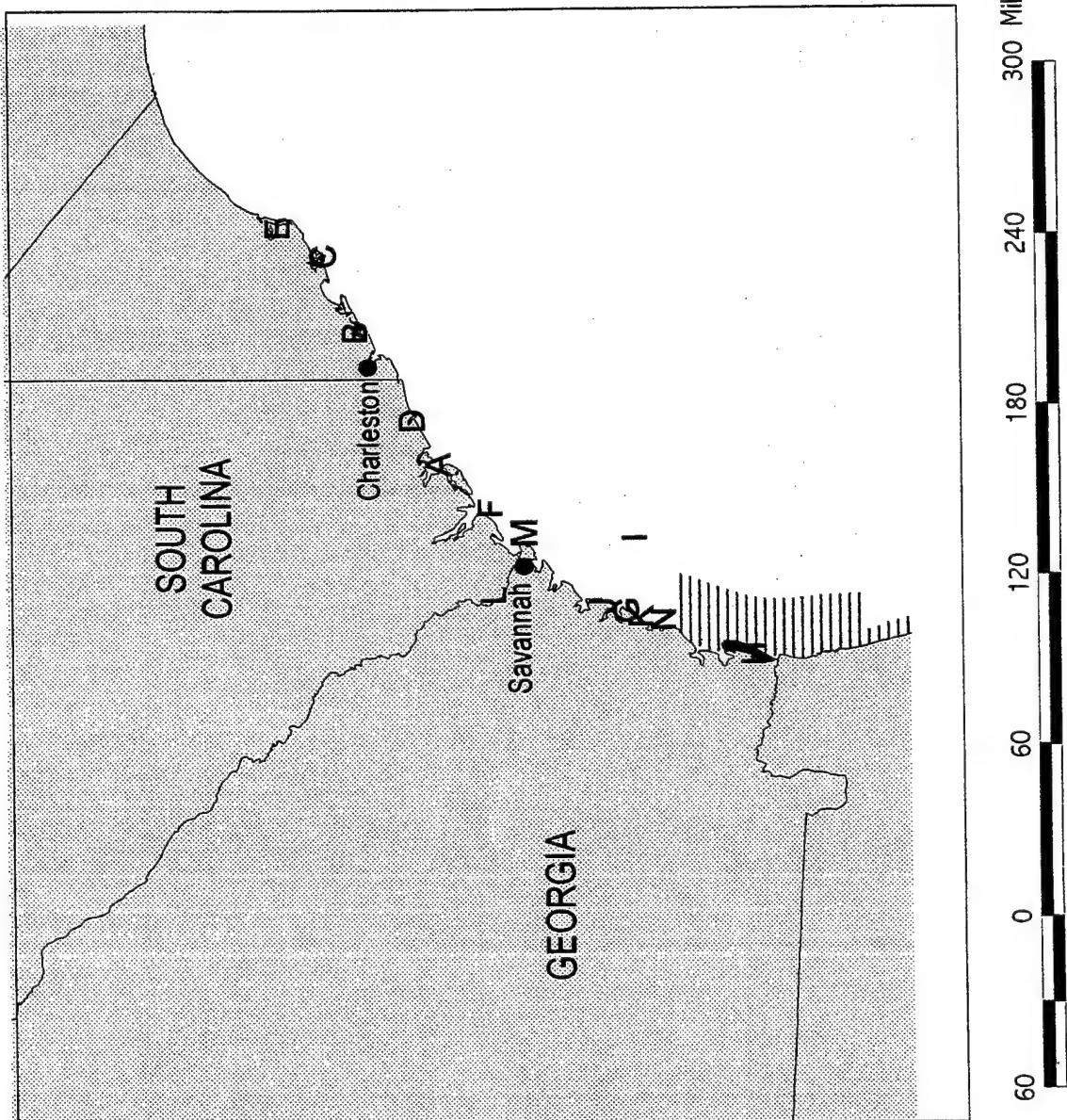


Table 9. South Carolina and Georgia sanctuaries and reserves.

Region	Name	Letter Design	Size (acres)	Habitat Types	Listed Marine Animals	Comments	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
SW Allian:	ACE Basin National Estuarine Research Reserve	A	140312	saltmarsh	loggerhead sea turtle, manatees			2.5	South Carolina Dept of Natural Resources	P.O. Box 12559	Charleston	SC	29412	803 762 5000
SC	Bird Key - Stono Heritage Preserve	B	20	saltmarsh, sandy shore				14	South Carolina Dept of Natural Resources	P.O. Box 167	Columbia	SC	29202	803 734 3893
SW Allian:	Blackbeard Island National Wildlife Refuge	G	5618	freshwater marsh, saltmarsh, sandy shore	manatees, loggerhead sea turtles			6	Savannah Coastal Refuge/U.S. Fish and Wildlife Service	1000 Business Center Drive, Suite 10	Savannah	GA	31405	912 652 4415
SC	Cape Romain National Wildlife Refuge	C	34229	saltmarsh, sandy shore	loggerhead sea turtle			6	U.S. Fish and Wildlife Service	5801 Hwy 17N	Awadaw	SC	29429	803 928 3368
SW Allian:	Cumberland Island National Seashore	H	33900	saltmarsh, sandy shore	sea turtles			9	National Park Service	P.O. Box 806	St. Mary's	GA	31558	912 882 4336
SW Allian:	Deveaux Bank Heritage Preserve	D	15	sandy shore				14	South Carolina Dept of Natural Resources	P.O. Box 167	Columbia	SC	29202	803 734 3893
SC	Grey's Reef National Marine Sanctuary	I		reefs	righth whales, loggerhead sea turtles			2.5	NOAA Sanctuaries and Reserves Division	10 Ocean Science Circle	Savannah	GA	31411	912 598 2345
SW Allian:	Herrie Neck National Wildlife Refuge	J	2762	salt marsh, freshwater marsh	manatees, loggerhead sea turtles			6	Savannah Coastal Refuge/U.S. Fish and Wildlife Service	1000 Business Center Drive, Suite 10	Savannah	GA	31405	912 652 4415
SC	North Inlet-Winyah Bay National Estuarine Research Reserve	E	12335	salt marsh	loggerhead sea turtle			20	South Carolina Dept of Natural Resources	Berch Marine Laboratory, University of Georgia	Georgetown	SC	29442	803 546 6218
SW Allian:	Pinckney Island National Wildlife Refuge	F		saltmarsh				6	U.S. Fish and Wildlife Service			SC		
SC	Sapelo Island National Estuarine Research Reserve	K	17950	saltmarsh, sandy shore	loggerhead turtle			2.5	Georgia Dept of Natural Resources	P.O. Box 15	Sapelo Island	GA	31327	912 485 2251
SW Allian:	Savannah National Wildlife Refuge	L	25608	freshwater marsh	manatees			6	Savannah Coastal Refuge/U.S. Fish and Wildlife Service	1000 Business Center Drive, Suite 10	Savannah	GA	31405	912 652 4415
GA	Wassaw National Wildlife Refuge	M	10070	sandy shore, saltmarsh	loggerhead sea turtles			6	Savannah Coastal Refuge/U.S. Fish and Wildlife Service	1000 Business Center Drive, Suite 10	Savannah	GA	31405	912 652 4415
GA	Wolf Island National Wildlife Refuge	N	5126	saltmarsh, sandy shore	loggerhead sea turtles, manatees			6	Savannah Coastal Refuge/U.S. Fish and Wildlife Service	1000 Business Center Drive, Suite 10	Savannah	GA	31405	912 652 4415

NORTHWEST ATLANTIC

Virginia, Maryland, Delaware and North Carolina Sanctuaries

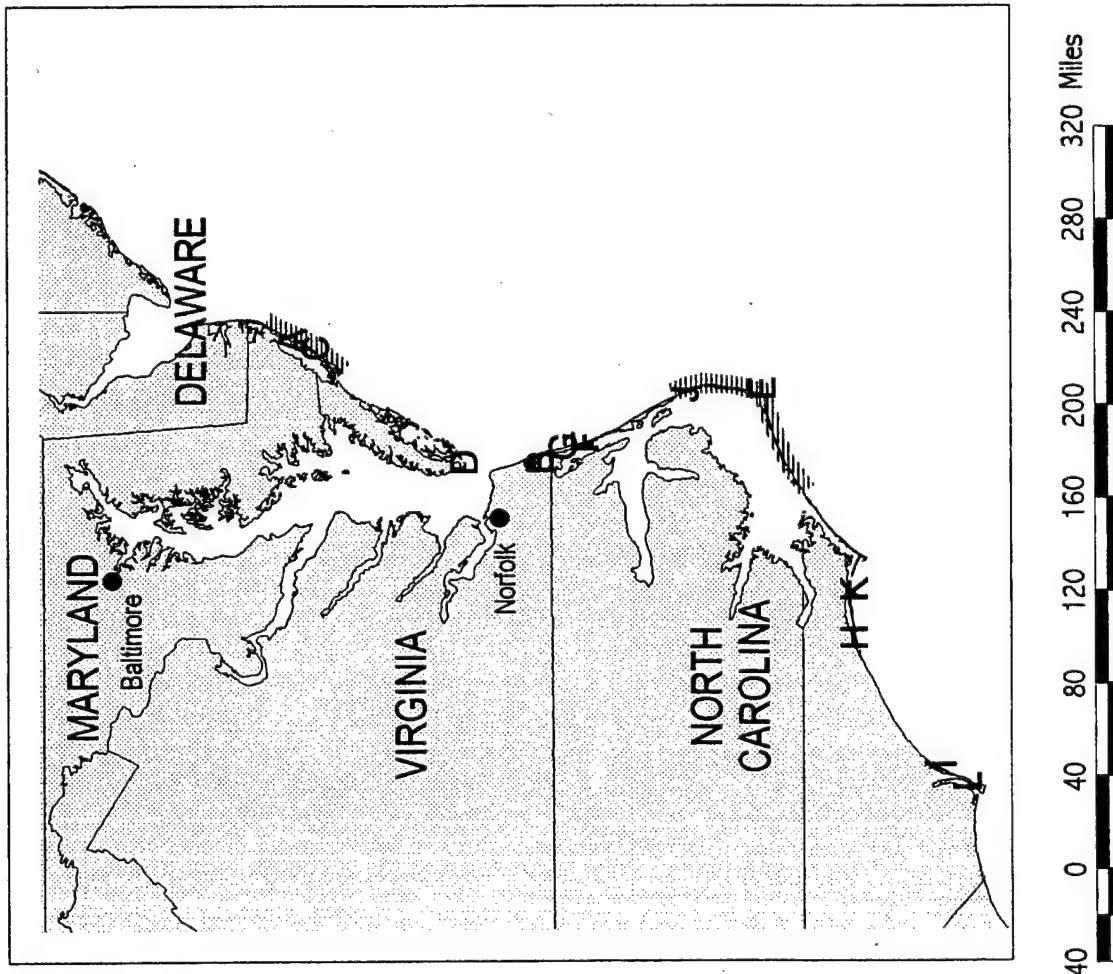


Table 10. Virginia, Maryland, Delaware and North Carolina sanctuaries and reserves.

Region	Name	Letter Design	Habitat Types (acres)	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
NW Allian: MD National Seashore	Assateague Island National Seashore	A	18000 saltmarsh, sandy shore, saltmarsh	loggerhead turtles		9 U.S. Fish and Wildlife Service	National Park Service	7206 National Seashore Lane	Berlin	MD	21811	410 641 1441
NW Allian: VA Refuge	Back Bay National Wildlife Refuge	B				6 U.S. Fish and Wildlife Service	4005 Sandpiper Rd.	Virginia Beach	VA	23456	804 721 2412	
NW Allian: NC Seashore	Cape Hatteras National Seashore	E		sandy shore, saltmarsh		9 National Park Service	Roule 1, Box 675	Manteo	NC	27954	919 473 2111	
NW Allian: VA Wildlife Refuge	Chincoteague National Wildlife Refuge	C	14014 saltmarsh, sandy shore, saltmarsh	loggerhead turtles		6 U.S. Fish and Wildlife Service	Box 62	Chincoteague	VA	23336	804 336 6122	
NW Allian: NC Component - North Carolina National Estuarine Research Reserve	Currituck Banks Component - North Carolina National Estuarine Research Reserve	F	960 salt marsh, sandy beaches	loggerhead sea turtles		20 U.S. Fish and Wildlife Service	UNCW/CMSR, 7205 Wrightsville Ave	Wilmington	NC	28403	919 256 3721	
NW Allian: NC Refuge	Currituck National Wildlife Refuge	G		sandy shore	loggerhead sea turtles	6 U.S. Fish and Wildlife Service	c/o Mackay Island NWR, PO Box 39	Knots Island	NC	27950-0039	919 429 3100	
NW Allian: VA Wildlife Refuge	Fisherman Island National Wildlife Refuge	D	1700 saltmarsh, sandy shore	kemp ridley, loggerhead, green and leatherback sea turtles		6,18 U.S. Fish and Wildlife Service	c/o Eastern Shore of Virginia NWR, RFD 1 Box 122B	Cape Charles	VA	23336	804 331 2760	
NW Allian: NC Park	Hammocks Beach State Park	H	736 sandy shore, saltmarsh	loggerhead sea turtles		15 North Carolina State Parks	1572 Hammocks Beach Road	Swansboro	NC	28584	919 326 4881	
NW Allian: NC Component - North Carolina National Estuarine Research Reserve	Masonboro Island Component - North Carolina National Estuarine Research Reserve	I	5097 salt marsh, sandy beaches	loggerhead and green sea turtles		20 UNCW/CMSR, 7205 Wrightsville Ave.	Wilmington	NC	28403	919 256 3721		
NW Allian: NC Refuge	Pee Island National Wildlife Refuge	J	5980 sandy shore	green and loggerhead sea turtles		6 U.S. Fish and Wildlife Service	c/o Alligator River NWR, PO Box 1969	Manteo	NC	27954	919 987 2394	
NW Allian: NC Reserve	Rachel Carson Component - North Carolina National Estuarine Research Reserve	K	2625 salt marsh, sandy beaches	loggerhead sea turtles		20 UNCW/CMSR, 7205 Wrightsville Ave.	Wilmington	NC	28403	919 256 3721		
NW Allian: NC National Estuarine Research Reserve	Zake's Island Component - North Carolina National Estuarine Research Reserve	L	1160 salt marsh, sandy beaches	loggerhead sea turtles		20 UNCW/CMSR, 7205 Wrightsville Ave.	Wilmington	NC	28403	919 256 3721		

New York, Rhode Island and Connecticut Sanctuaries

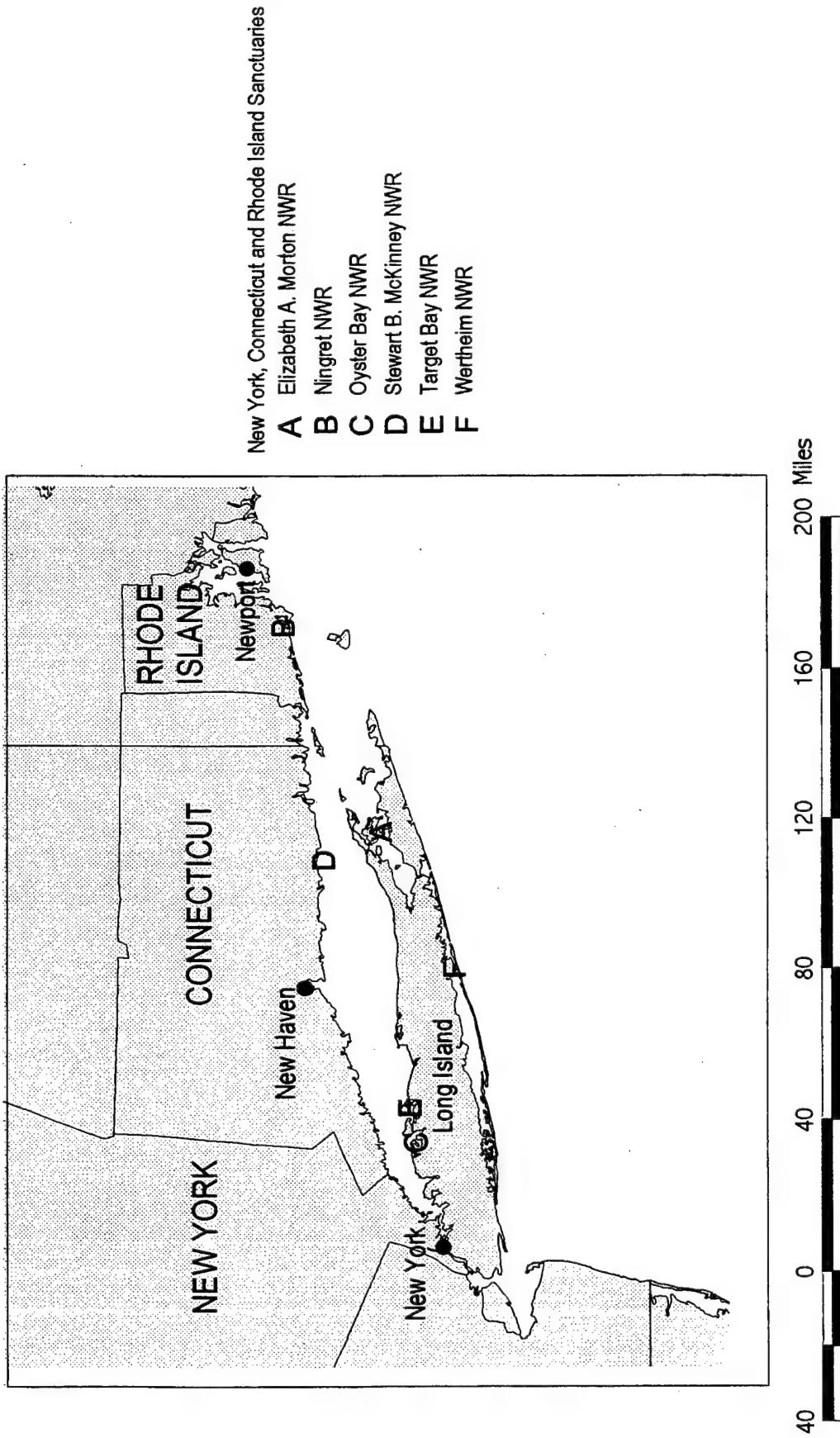


Table 11. New York, Rhode Island and Connecticut sanctuaries and reserves.

Region	Name	Letter Design	Size (acres)	Habitat Types	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST Zip Code	Phone #
NW Altan: NY	Elizabeth A. Morton National Wildlife Refuge	A		sandy shore, saltmarsh, freshwater marsh	Kemp ridley and loggerhead sea turtles, roseate tern		6 U.S. Fish and Wildlife Service	c/o Long Island Complex, PO Box 21	Shirley	NY	11967	516 286 0485
NW Altan: RI	Ninigret National Wildlife Refuge	B					6 U.S. Fish and Wildlife Service	PO Box 307	Charlestown	RI	2813	401 364 9124
NW Altan: NY	Oyster Bay National Wildlife Refuge	C		saltmarsh, freshwater marsh, sandy shore	Kemp ridley, leatherback and loggerhead sea turtles		6 U.S. Fish and Wildlife Service	c/o Long Island Complex, PO Box 21	Shirley	NY	11967	516 286 0485
NW Altan: CT	Sleater B. McKinney National Wildlife Refuge	D			roseate tern		6 U.S. Fish and Wildlife Service	PO Box 1030	Westbrook	CT	6498	203 399 2513
NW Altan: NY	Tarbet Bay National Wildlife Refuge	E		saltmarsh, sandy shore	loggerhead turtles, least and common terns		6 U.S. Fish and Wildlife Service	c/o Long Island Complex, PO Box 21	Shirley	NY	11967	516 286 0485
NW Altan: NY	Wertheim National Wildlife Refuge	F		saltmarsh, sandy shore	loggerhead turtles		6 U.S. Fish and Wildlife Service	c/o Long Island Complex, PO Box 21	Shirley	NY	11967	516 286 0485

Massachusetts, New Hampshire and Maine Sanctuaries

Massachusetts, New Hampshire and Maine Sanctuaries

A Acadia National Park
B Cape Cod National Seashore
C Great Bay NERR
D Mashpee NWR
E Monomoy NWR
F Petit Manan NWR
G Pond Island NWR
H Rachel Carson NWR
I Right Whale Crit. Hab.- Cape Cod Bay
J Right Whale Crit. Hab. - Great South Channel
K Stellwagen Bank NMS
L Waquoit Bay NERR
M Wells NERR
S Stellwagen Bank NMS
Right Whale Critical Habitat
Cape Cod National Seashore

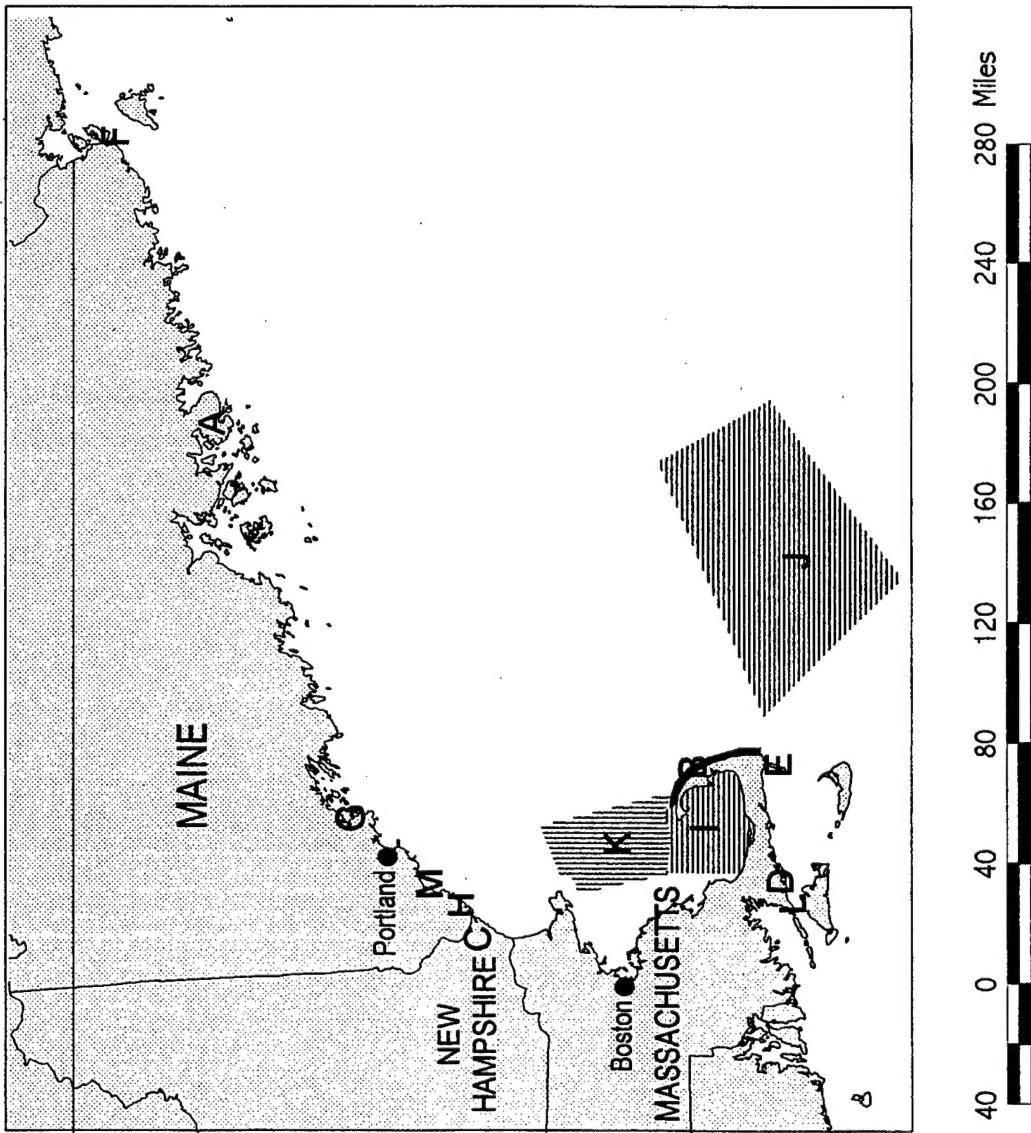


Table 12. Massachusetts, New Hampshire and Maine sanctuaries and reserves.

Region	Name	Letter Design	Size (acres)	Habitat Types	Listed Marine Animals	Special Comments	Info Sources	Admin	Street Address	City	ST	Zip Code	Phone #
NW Allian: ME	Acadia National Park	A	40000	rocky islands, forest	roseate and least terns		9	National Park Service	PO Box 177	Ber Harbor	ME	4699	207 288 3338
NW Allian: MA	Cape Cod National Seashore	B	42557	sandy shore	right whales		9	National Park Service	99 Marconi Site Road	Wellfleet	MA	2667	508 349 3785
NW Allian: NH	Great Bay National Estuarine Research Reserve	C	5280	sandy shore, saltmarsh	common terns		5	N.H. Fish and Game Department	37 Concord Rd	Durham	NH	3824	603 868 1095
NW Allian: MA	Mashpee National Wildlife Refuge	D			roseate terns		6	U.S. Fish and Wildlife Service	c/o Great Meadows NWR, Weir Hill Rd	Sudbury	MA	1776	508 443 4861
NW Allian: MA	Monomoy National Wildlife Refuge	E		sandy shore	roseate terns		6	U.S. Fish and Wildlife Service	Wikis Way Morris Island	Chatham	MA	2633	508 945 0594
NW Allian: ME	Petit Manan National Wildlife Refuge	F			roseate and least terns		6	U.S. Fish and Wildlife Service	Box 279	Milbridge	ME	4658	207 546 2124
NW Allian: ME	Pond Island National Wildlife Refuge	G	10	sandy shore	roseate terns		6	U.S. Fish and Wildlife Service	Box 279	Milbridge	ME	4658	207 546 2124
NW Allian: ME	Rachel Carson National Wildlife Refuge	H	4500		roseate and least terns		6	U.S. Fish and Wildlife Service	Box 751	Wells	ME	4090	207 646 9226
NW Allian: MA	Right Whale Critical Habitat - Great South Channel	I		shoal	right, humpback, fin, blue, sei whales and roseate terns		16	National Marine Fisheries Service Office of Protected Resources	1335 East-West Highway	Silver Spring	MD	20910	301 713 2333
NW Allian: MA	Right Whale Critical Habitat - Cape Cod Bay	J		shoal	right, humpback, fin, blue, sei whales and roseate terns		16	National Marine Fisheries Service Office of Protected Resources	1335 East-West Highway	Silver Spring	MD	20910	301 713 2333
NW Allian: MA	Stellwagen Bank National Marine Sanctuary	K			right, humpback, fin, blue, sei whales and roseate terns		5	NOAA Sanctuaries and Reserves Division	14 Union Street	Plymouth	MA	2360	508 747 1691
NW Allian: MA	Waquoit Bay National Estuarine Research Reserve	L	2250	sandy shore, saltmarsh	roseate and least terns		5	NOAA Sanctuaries and Reserves Division	PO Box 3092	Waquoit	MA	2836	508 457 0495
NW Allian: ME	Wells National Estuarine Research Reserve	M	1600	sandy shore, saltmarsh	least tern		5	NOAA Sanctuaries and Reserves Division	342 Laudholm Farm Road	Wells	ME	4090	207 646 1555

REFERENCES

- 1 McArdle, D. 1997. California Marine Protected Areas. California Sea Grant College System. Publication No. T-039.
- 2 NOAA. 1994. An Overview of the Sanctuaries and Reserves Division. Congressional Briefing: Second Edition.
- 3 Monterey Bay NMS Site Characterization Web Page <http://205.155.38.2/sitechar/index.html>
- 4 Channel Islands NMS Home Page: <http://www.cinms.rain.org>
- 5 NOAA National Marine Sanctuaries homepage: <http://wave.nos.noaa.gov/ocrm/nmsp>
- 6 National Wildlife Refuges website: <http://refuges.fws.gov>
- 7 Ano Nuevo web page: <http://www.anonuevo.org>
- 8 California Department of Fish and Game website: <http://www.dfg.ca.gov>
- 9 National Park Service webpage: <http://www.nps.gov>
- 10 Washington GAP Analysis project webpage: <http://salmo.cqs.washington.edu:80/~wagap/birds>
- 11 Forest Service web page: <http://www.fs.fed.us>
- 12 Great Outdoor Recreation Pages web page: <http://www.gorp.com/gorp/resource>
- 13 California Coastal Commission. 1987. California Coastal Resource Guide. University of California Press: Berkeley. 384 pp
- 14 South Carolina Heritage Preserves webpage: <http://www.dnr.state.sc.us/wild/heritage/preservedesc/html>
- 15 North Carolina parks webpage: <http://ils.unc.edu/parkproject/habe.html>
- 16 Federal Register web page: <http://frwebgate.access.gpo.gov/>
- 17 Chincoteague National Wildlife Refuge Resource Manager e-mail 9/19/97
- 18 Eastern Shore of Virginia NWR Supervisory Refuge Operations Specialist, James Wood, e-mail 9/24/97
- 19 Apalachicola NERR webpage: <http://inlet.geol.sc.edu/APA/>
- 20 NOAA National Estuarine Research Reserves homepage: <http://wave.nos.noaa.gov/ocrm/nerr/reserves>
- 21 Texas State Parks webpage: <http://www.tpwd.state.tx.us/park>
- 22 Wild Texas webpage: <http://www.wildtexas.com>
- 23 NOAA/NMFS/AFSC/NMML web page: <http://nmml01.afsc.noaa.gov>
- 24 Florida Parks web page: <http://www.dep.state.fl.us/parks/>